DATA AIRE INC.

dap™4
Operation Manual

Data Aire, Inc.
230 W. BlueRidge Avenue
Orange, CA 92865

www.dataaire.com

Data Aire, Inc. reserves the right to make design changes for the purpose of product improvement or to withdraw any design without notice.

Table of Contents

Introduction
- Standard Features 5
- Operational Features 6
- Diagnostics and Service Features 6
- Display Panel 7
- Functions Displayed 7
- Warnings and Alarms Displayed 7
- Historical Data Displayed 7
- Programmable Selections 8

Getting Started
- Powering the Unit ON/OFF 10
- Accessing Menus/Passwords 10
- Service Level Password 11
- Changing the Service Level Password 12

Menus
- Menu A - ON/OFF 13
- Menu B - Setpoints 14
- Menu C - Clock/Scheduler 16
- Menu D - Input/Output 20
- Menu E - Historical Data 23
- Menu F - Information 25
- Menu G - Network Config 26
- Menu H - Calibrate Sensors 27
- Menu I - Manual Control 29
- Menu J - Factory Setting 31
- Menu K - Alarms and Limits 38
- Menu L - Configure I/O 46

dap4 Control Logic 64

Temperature Sensor Chart 76

gForce DX Series with dap4 Controller wiring diagram 77

dap4 Control Board PIN ID 78

Manual Bypass wiring diagram 80

Manual Bypass Switches 82

dap™ 4

The dap4 continues the tradition of advanced electronic devices from Data Aire for monitoring and control of computer room air conditioning units which began in 1977. Each generation has provided more accurate monitoring information and flexibility in controlling the unit.

The dap4 offers the definite answer for precision environmental control. The dap4 control system not only controls and monitors temperature, humidity, airflow and cleanliness, it provides component run times, alarm history and an automatic self-test of the microprocessor. All messages are sequentially displayed on a backlit LCD (liquid crystal display). The dap4 can interface with a variety of building management systems (BMS).

Standard Features

Stand Alone Panel: Service terminals or additional devices are not required for programming or monitoring functions

Microprocessor Based: 32 bit, 44 MHz Micro controller. State-of-the-Art technology and reliability in a programmable solid-state control module

LED Illuminated Keys: Six highly reliable keys allow movement through the menus

Backlit Liquid Crystal Display (LCD): Information is displayed and presented in a format that is easily viewed and understood

All Settings are Programmable from the Face of the Panel: Expedient and user friendly

USB Port: Allows download/upload of software, historical data and commissioning

Multi-Level Password Access: Controls any unauthorized changes to settings and system functions

Database of Unit and Room Conditions: Historical data that facilitates service, apparatus set-up and fine tuning of setpoints

Rechargeable Battery Backup for Historical Data: Extensive historical data is preserved by integral battery backup in case of power failure

Factory Programmed Menus: Menus that pertain to the type and method of cooling, reheat and humidification based on the unit's components and options

Programmed Settings Saved in Flash Memory: Non-volatile memory stored so all control settings and operational parameters are secured indefinitely even during a power outage

Factory Calibrated Temperature and Humidity Sensors: Accurate and consistent regulation especially in multiple unit applications

OPERATIONAL FEATURES

(Optional features may require additional components and/or sensors)

Sequential Load Activation: Time and temperature based logic that sequentially starts and stops stages of cooling and reheat

Compressor Short-Cycle Control: Prevents excessive compressor wear by using restart and anti-cycle limits

Automatic or Manual Restart: Restart methods are programmable in the event of a power failure

Supplemental Compressor Operation during Energy Saver Mode: Extends the savings from Energy Saver by allowing one or two compressors to supplement the cooling as needed when Energy Saver cooling is not sufficient

Humidity Anticipation: Modifies the humidity setpoint to reduce excess humidification and dehumidification

Dehumidification Mode Lockout: Inhibits dehumidification if not required for system performance

Start Time Delay: Programmable time delay staggers the start-up of multiple units to prevent high power demand peaks

Chilled Water, Energy Saver and Hot Water Coil Flush Cycle: Periodically circulates fluid in the coil to reduce deposit build-up in system

Automatic Compressor Rotation: Periodically rotates the lead/lag compressor sequence to balance run times

Automatic Reheat Element Rotation: Rotates the staging sequence to balance the heating elements run times

Energy Saver (Glycol) or Auxiliary Chilled Water Operation: Two types of Energy Savers Systems are available

Programmable Water Under the Floor Alarm: Programmable to activate alarm, stop compressor operation or complete unit shut down

DIAGNOSTICS AND SERVICE FEATURES

Alarms Displayed in Order of Occurrence: Sequence with time of occurrence assist in diagnosing the cause of alarm(s)

Programmable Delays for Optional Alarms: Reduces nuisance and false alarms caused by temporary or transient conditions

Manual Diagnostics Program: Provides accessible procedures to test the processor and major system components

External Manual Override for Blower, Cool 1, Cool 2, Humidification, Water Valve and Fan Speed Control: The control circuit is operable if the processor is not functioning properly

Adjustable Alarm Limits: Threshold levels for temperature and humidity alarms are programmable

Four Programmable Alarms Contacts: Four standard alarms contacts are programmable for remote monitoring

Audio Alarm Tone: Three (3) programmable alarm tones are available

Alarm History: 100 alarms can be stored for system follow-up

DISPLAY PANEL

Conditions and Data Displayed

TEMPERATURE: Current return air temperature (°F or °C)

DISCHARGE AIR: Current chilled water temp (°F or °C)*

UNIT ID/ZONE ID: Assigned unit ID and Zone Number*

TEMPERATURE SETPOINT: Current temp setpoint (°F or °C)

HUMIDITY SETPOINT: Current humidity setpoint (%)

UNIT TYPE: Data Aire model type

DATE: Current date (month/day/year)

TIME: Current time (hour/minute)

UNIT STATUS: ON or OFF

HUMIDITY: Current return air humidity (%)

CHILLED WATER TEMPERATURE: Current Temperature (°F or °C)*

* This optional feature or data display may require additional components and/or sensors

FUNCTIONS DISPLAYED

COOLING: 1st stage, 2nd stage, 3rd stage*, 4th stage*

DEHUMIDIFICATION: Appears when operating

CHILLED WATER FLOW: 10-100% (based on VDC output)

FAN SPEED: 0-100% (based on VDC output – plug fan units

HUMIDIFICATION: Appears when operating

REHEAT: 1st stage, 2nd stage, 3rd stage

ENERGY SAVER: Appears when operating

* This optional feature or data display may require additional components and/or sensors

WARNINGS AND ALARMS DISPLAYED

HIGH TEMPERATURE WARNING
HIGH HUMIDITY WARNING
POWER FAILURE RESTART
UNDER FLOOR WATER DETECTION
LOW PRESSURE COMPRESSOR 1
MANUAL OVERRIDE
HUMIDIFIER PROBLEM*
TEMPERATURE SENSOR FAILURE
COMPRESSOR SHORT CYCLE
LOCAL ALARM*
CUSTOM MESSAGE*
DISCHARGE AIR SENSOR ERROR*
STANDBY PUMP ON*
HIGH PRESSURE/INTERNAL OVERLOAD COMP 1

LOW TEMPERATURE WARNING
LOW HUMIDITY WARNING
NO AIRFLOW
DIRTY FILTER
LOW PRESSURE COMPRESSOR 2
FIRESTAT TRIPPED
MAINTENANCE REQUIRED
HUMIDITY SENSOR FAILURE
NO WATER FLOW*
SMOKE DETECTOR*
FAN MOTOR OVERLOAD*
HIGH CONDENSATE WATER LEVEL*
PERSON TO CONTACT ON ALARM
HIGH PRESSURE/INTERNAL OVERLOAD COMP 2

* This optional feature or data display may require additional components and/or sensors

HISTORICAL DATA DISPLAYED

EQUIPMENT RUNTIMES: Blower, compressor 1, compressor 2, reheat strip 1, 2, and 3, dehumidification, Energy Saver*, humidifier, condenser and chilled water

ALARM HISTORY: Alarm list with time and date of occurrence

LAST 24 HOURS: High and low temperature, high and low humidity

AVERAGE PERCENT OF CAPACITY LAST HOUR: Compressor(s), humidifier, reheat strips and water valve

PROGRAMMABLE SELECTIONS

TEMPERATURE SETPOINT
HIGH TEMPERATURE ALARM LIMIT
HUMIDITY SETPOINT
HIGH HUMIDITY ALARM LIMIT
COMPRESSOR LEAD/LAG SEQUENCE
AUDIO ALARM MODE
COMPRESSOR SHORT CYCLE ALARM
LOW DISCHARGE TEMPERATURE ALARM LIMIT*
SYSTEM START DELAY
MESSAGE FOR OPTIONAL ALARM 1, 2, 3, and 4*
DELAY FOR OPTIONAL ALARM 1, 2, 3, and 4
COMPRESSOR ASSIST TO ENERGY SAVER
REMOTE ALARM 1, 2, 3, and 4 SELECTION
FIRESTAT TEMPERATURE ALARM LIMIT
CALIBRATE TEMPERATURE SENSOR
CALIBRATE HUMIDITY SENSOR
SCHEDULED NORMAL MAINTENANCE
NETWORK PROTOCOL*
CALIBRATE DISCHARGE AIR SENSOR*
CALIBRATE CHILLED WATER TEMPERATURE SENSOR*
TEMPERATURE DEADBAND
LOW TEMPERATURE ALARM LIMIT
HUMIDITY DEADBAND
LOW HUMIDITY ALARM LIMIT
RESET EQUIPMENT RUNTIMES
HUMIDITY ANTIC PAT ION
DEHUMIDIFICATION MODE
POWER RESTART/RESTART MODE
MANUAL DIAGNOSTICS
PERSON TO CONTACT ON ALARM
WATER VALVE MODE
HUMIDIFIER AUTOFLUSH TIMER*
TEMPERATURE SCALE
REHEAT STAGES
COMPRESSORS
HUMIDIFIER
WATER VALVE VOLTAGE RANGE
REVERSE ACTING WATER VALVE
COOLING STAGE to STAGE BAND

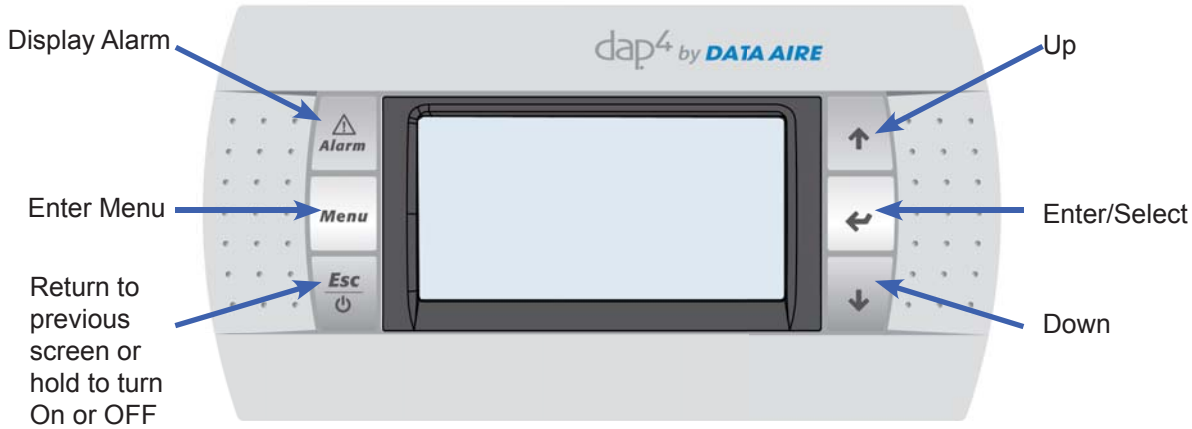
Getting Started:

The dap4 consists of two main components: the control module and the display panel. The control module is located in the electrical panel. The display panel is remotely mounted to one of the outer front doors. The two are connected by special telephone type cable harness (units may be ordered with longer cables for optional remote wall mounting). *Note*: If used, regular telephone cable will not operate. Factory cable is required.

All data displayed on the display screen originates from the control module. The display panel has a backlit LCD (liquid crystal display). There are six keys on the face of the display panel to retrieve or enter settings.

Control Module

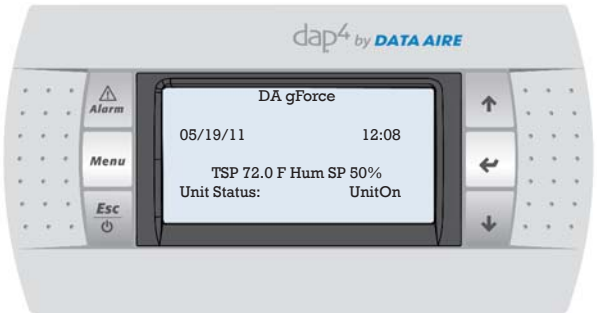
Display Module



Button Functions

Alarm	Allows viewing of active alarms Silences audible alarms Resets active alarms
Menu	Allows entry to Main Menu
Esc	Return to previous screen Hold to turn ON or OFF
↑	Allows scrolling to next screen Allows values changes (increase)
↵	Allows entry to Menus Advances cursor
↓	Returns to previous screen Allows value changes (decrease)

The Main Screen allows you to see the current unit status (temperature, relative humidity and operating mode – cooling, humidification, etc.).



Powering the Unit ON/OFF

> ⚠ Before powering unit ON, check that power is available and proper connections have been completed

Note: The unit is shipped with the control power in the OFF (Off by Key) position

Turn the disconnect switch to the ON position. The controller display keys and screen will illuminate and the processor will conduct a self-test (the screen will remain illuminated with no messages until the testing is complete). The self-test takes approximately 20 seconds. Once completed, the Main Menu screen will be displayed.

The Main Menu screen will display the unit type, date and time, and unit status. In addition, the screen will scroll and display the temperature, relative humidity and operating mode.

The Unit Status will indicate the unit:"OFF by Key"

The unit may be turned ON at any time. Hold the Esc key for approximately 5 seconds. The display will continue to scroll and display messages. At the same time the unit status is changed to "Unit On". Once powered there will be a 5-600 second start delay indicated by "Time Before Start: XXs".

Note: The start time delay is programmable from 5-600 seconds (Menu A – ON/OFF). The factory setting is 5 seconds.

For initial programming of setpoints, alarms, delays, etc. it is not necessary to have the unit ON. With the unit in the "OFF by Key" mode, all settings are available to view and change (other than Menus J – Factory Settings and L – Configure Inputs/Outputs) if the proper password is entered.

Once the desired settings are complete, change to the Unit to ON by holding the Esc Key for approximately (five) 5 seconds.

Accessing Menus/Passwords

To access any Menu a numerical password is required. There are three levels of password:

- SERVICE LEVEL
- FACTORY LEVEL
- ZONE MASTER

The SERVICE LEVEL password allows viewing and changes to the following Menus:

A. On/Off
B. Setpoint
C. Clock/Scheduler
D. Input/Output
E. Historical Data
F. Information
G. Network Configuration
H. Sensor Calibration
I. Manual Control
K. Alarms/Limits

The FACTORY LEVEL password allows changes to the SERVICE LEVEL Menus plus the following Menus:

J. Factory Settings
L. Configure I/O

The ZONE MASTER password is only required for those units with optional Zone Master control.

To enter the Menu and Sub-Menu screens, press the MENU key on the display panel. A password will be requested. The password is a four digit entry (including 0). Units are shipped from the factory with the password requirement bypassed to accommodate start-up and set-up.

The display screen will have the following message:

The Service Level Password setting from the factory is: 0000
The cursor will be flashing by the Security Access message at the top of the screen. Press the ENTER key to move the cursor. The cursor will flash at the first input (represented by a 0). Press the UP or DOWN keys to increase or decrease the value. Once the value is entered, press the ENTER key to move to the next input. Increase or decrease the value by pressing the UP or DOWN keys. Once the value is entered, press the ENTER key to move to the next input.

Once all four values are entered, press the Enter key. If the password is incorrect, the following message will appear: ***Password Wrong!*** The cursor will return to the first input value. Follow the same procedure to re-enter the password.

Once the correct password is entered and accepted, the Menus will display on the screen. Only those Menus allowed through the Service Password will be available. Use the UP or DOWN keys to scroll through the available Menus.

Note: Factory Level Menus are for configuring the unit. The dap4 controller is used for a variety of equipment types. The controller is based on the unit type, unit components and options. Under normal circumstances these menus should not be changed. If they need to be changed, please consult with Data Aire engineering or service personnel before proceeding.

Changing the Service Level Password

The Service Level password can be changed by doing the following:

Enter the Main Menu by pressing the Menu key. You will be prompted to Insert the Service Level password. Enter the current password as previously explained.

▼ Press the Menu key. The screen will display the following message:

▼ Press the Enter key. The cursor will highlight the first input. Change the input by pressing the

UP or Down key. Once the selected number is displayed, press the Enter key to move to the next input. Repeat the same steps for each input.

After the last input has been entered, press the MENU key to return to Main Menu. The password is stored.

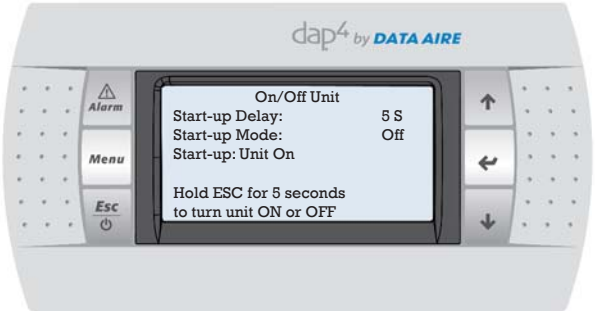
Entering Menu Settings

MENU A – ON/OFF

MENU A allows the unit power to be switched from ON to OFF and OFF to ON (the Service Level password is required for entry).

Enter Menu A by pressing the MENU key. Use the UP or DOWN key to scroll through the menus. Press the UP or DOWN key until “A. On/Off” (factory setting) appears and is highlighted. Press the ENTER key.

The following will appear on the display screen:



The curser will be flashing at the upper left hand corner. Press the ENTER key. The curser will move to the “Change to: SWITCH OFF”. Press either the UP or DOWN button to change the status. Press the ENTER key to save the setting.

- If selecting SWITCH OFF the STATUS will change to: OFFbyKey. The unit will be OFF
- If selecting SWITCH ON the STATUS will change to: UnitOn. The unit will be ON
- When switching from the SWITCH OFF selection to the SWITCH ON (and pressing the ENTER key), the following message will appear: Time Before Start: XXs

Note: The start time delay is programmable from 5-600 seconds (Menu J – Factory Settings)

Once a selection is made, to leave MENU A, press the MENU key. The Main Menu screen will continue to display other menus (B, C, E and F). To look at any of these menus scroll to the desired menu. Press the ENTER key. If you choose to return to the Main Screen, press the Esc key.

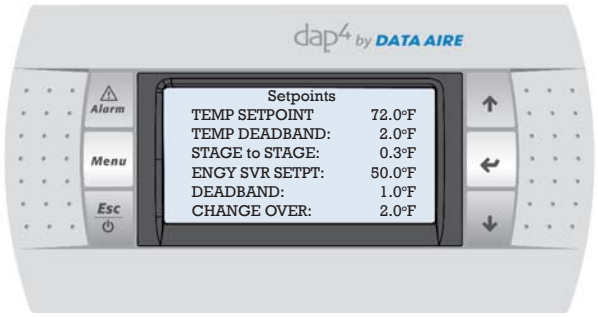
MENU B - SETPOINTS

MENU B allows viewing and changing of Setpoints (Service Level password is required for entry)

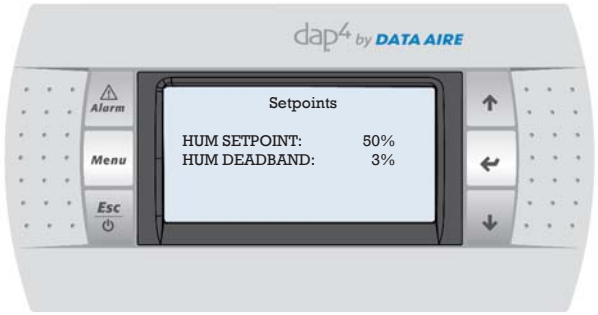
Press the UP or DOWN key until “B. Setpoint” appears and is highlighted. Press the ENTER key.

Use the UP or DOWN key to scroll through the screens. Menu B has two screens.

The following will appear on the first Menu B screen (values are for reference only):



Press the UP or DOWN key. The following will appear on the screen:



FACTORY SETTINGS

TEMPERATURE: ..... 72.0°F	(Temperature range: 65 - 85°F)
DEADBAND: ..... 2.0°F	(Temperature Deadband range: 2 - 5°F)
STAGE TO STAGE: ..... 0.3°F	(Stage-to-Stage range: 0.3 - 3.0°F)
ENGY SVR SETPT: ..... 50.0°F	(Setpoint range: 40.0 - 60.0°F)
DEADBAND: ..... 1.0°F	(Deadband range: 1.0 - 5.0°F)
CHANGE OVER: ..... 2.0°F	(Change over range: 2.0 - 5.0°F)
HUM SETPOINT: 50%	(Humidity range: 25-70%)
HUM DEADBAND: 3%	(Humidity deadband range: 1 - 15%)

If Humidity Anticipation is turned ON in humidity setting under Factory Setting (Menu J), the following page appears for reference (can not be edited):

Humidity Anticipation

HUM SETPOINT:.....50%
TEMP OFFSET:..... - 2%
ANTICIPATION SP:.....48%

To change the value of any one of the setpoint values, move the cursor by pressing the ENTER key to the desired setpoint. The cursor will flash on the input value. Press the UP or DOWN button to increase or decrease the value. Once the desired setpoint value has been changed, press the ENTER key to move to the next setting or until the cursor is at the top of the screen.

Exit the Setpoint Menu by pressing the Esc key. The display screen will return to the MAIN MENU. Use the UP or DOWN Keys to advance to another Menu or press the Esc Key to return to the normal operating mode.

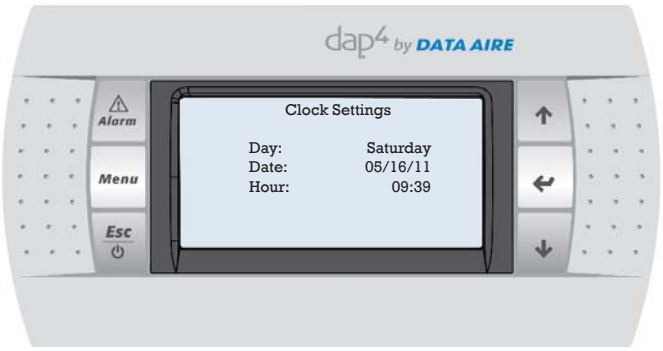
Note: Changes to any MENU input will remain and can only be changed manually (as described above)

MENU C – Clock/Scheduler

MENU C allows programming for setting night set-back, week-end and special day schedules

> Menu C should only be used for non-critical applications where units may be cycled off without any damage to sensitive electronic equipment. The typical application is comfort cooling where units may be shut down during non-working hours.

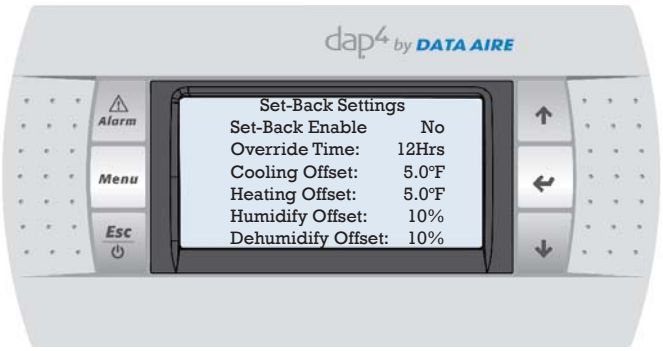
Enter Menu C by pressing the ENTER key. The following message will be displayed (values are for reference only):
To change the date or time, move the cursor by pressing the ENTER key to the date. To change



the date, use the UP or DOWN keys. By pressing the ENTER key the cursor will move from segment to segment. Only the UP and DOWN keys will change the value. The day will automatically change when the date has been altered.

Press the ENTER key until the cursor is in the title block (upper left hand corner). Press the UP or DOWN key to see the next screen.

The following will be displayed (values are for reference only):



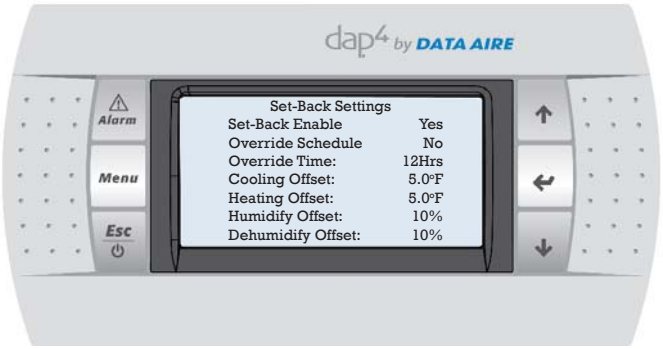
Note: Leaving the "Set-Back Enable" as NO, the set-back feature is non-operational and is the recommended setting for applications with constant load and cooling requirements.

The factory setting is NO

Ranges:

Override Time - the range is 1-12 hours
Heating Offset - the range is 0-30°F
Dehumidify Offset - the range is 0-30%
Cooling Offset - the range is 0-30°F
Humidify Offset - the range is 0-30%

If Set-Back enable is YES, the Override Schedule will appear as the following (values are for reference only):

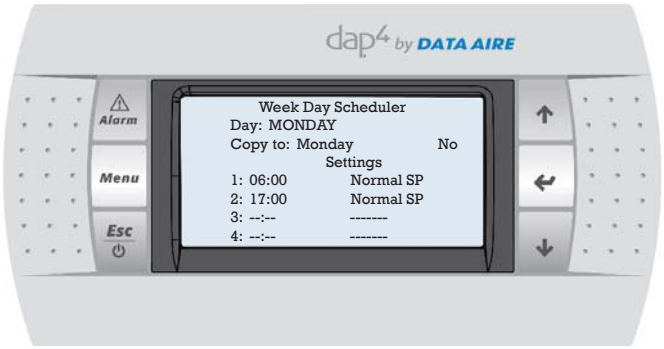


To change values, move the cursor to the desired input by pressing the ENTER key. Change the value by pressing either the UP or DOWN key. Once all changes are made to inputs on screen, move the cursor to the top and press the UP or DOWN keys to move to the next screen or press the MENU key to return to Main Menu screen.

Week Day Scheduler (only appears if the above Set-Back Enable selection was YES)

From the “Set-Back Settings” screen (with cursor at the top), press the DOWN key.

The following will be displayed (values are for reference only):



Screen Inputs

Press the ENTER key to move the cursor. The cursor will flash at the day (Monday). By pressing the UP or DOWN key all the days of the week can be viewed (or selected).

Press the ENTER key. The cursor will flash on the “Copy to: Day” Pressing the UP or DOWN key all the days of the week can be viewed.

The “Copy to:” function allows the user to copy setting from other days without going through the settings routine. By pressing the ENTER key, position the cursor on the Day: Press the UP or DOWN keys to scroll through the days of the week. Select the day that has been programmed and is to be copied. Press the ENTER key. The cursor will flash on the “Copy to:”. Scroll through the days using the UP or DOWN key. Select the day to copy. Press the ENTER key. The cursor will flash by the NO message. Press the UP or DOWN key to change for to YES. Press the ENTER key. The display will have a SUCCESSFUL COPY message (which quickly is automatically removed).

The cursor will return to the title block. Repeat the same step for each day to be copied or select ALL.

▼ Press the ENTER key. The cursor will flash on the “NO or Yes” setting. Pressing the UP or DOWN key will change from YES to NO or NO to YES. Leave in the NO setting until selections have been made.

▼ Press the ENTER key. The cursor will flash on the first time setting. All time is on a 24 hour clock (i.e. 6:00 PM = 1800 hours). The start time (line # 1) is selected by pressing the UP or DOWN key.

▼ Press the ENTER key to change the hour. By pressing the UP or DOWN key, the hour will change. Once the correct hour is selected, press the Enter key.

The cursor will flash on the minutes. By pressing the UP or DOWN key, the minutes will change. Once the correct minutes are selected, press the Enter key.

The cursor will be positioned on the settings input. Press the DOWN key to view the available selections:

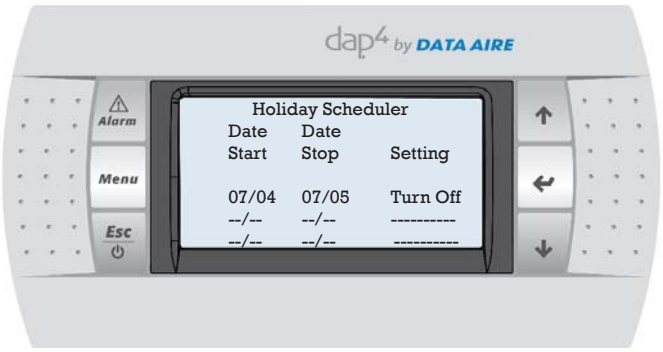
Set-Back; Normal SP (setpoint) Turn Off

▼ Press the ENTER key. The cursor will flash on the second time setting.

Repeat the steps to set the second time setting (and third and fourth if used).

Once the settings are complete, with the cursor in the title block, press the DOWN key to advance to the next screen or press Esc to return to the Main Menu or press the Esc key to return to normal operation.

The following will be displayed (values are for reference only):

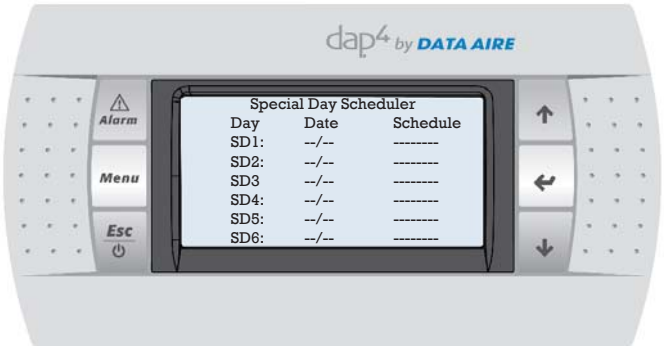


Available settings:

Normal SP
Turn Off
Set-Back

Once the settings are complete, with the cursor in the title block, press the DOWN key to advance to the next screen or press Esc to return to the Main Menu or press the Esc key to return to normal operation.

The following will be displayed (values are for reference only):



Available settings:

Normal SP
Turn Off
Set-Back

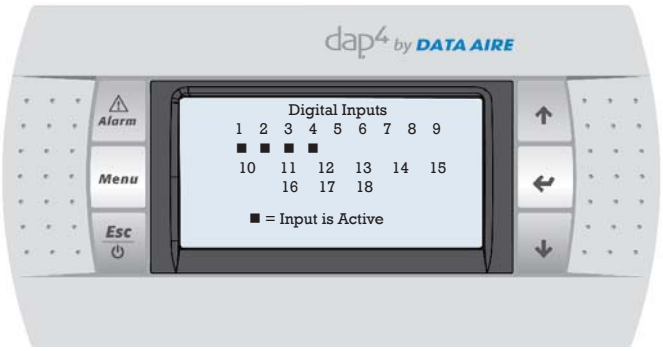
Once the settings are complete, with the cursor in the title block, press the DOWN key to advance to the next screen or press Esc to return to the Main Menu or press the Esc key to return to normal operation.

MENU D – INPUT/OUTPUT

MENU D is a view only menu allowing the user to view the various input and outputs. The values are factory set and only if instructed by Data Aire engineering or service personnel should these be changed.

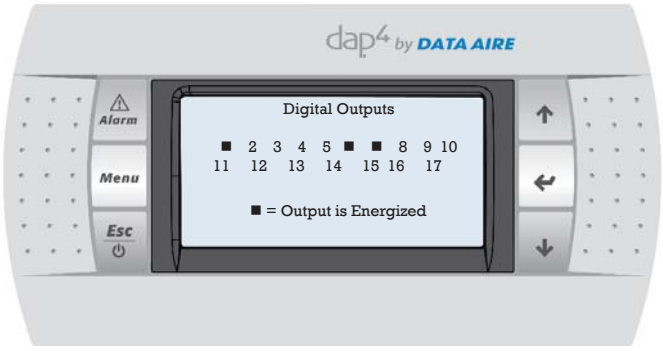
To view, press the Menu key. A prompt for the password will be displayed on the display module. Once the password is entered, the Main Menu screen will display the various menus. Scroll through the menus using either the UP or DOWN keys. Move Menu D to the highlighted area and press the ENTER key.

The following will be displayed (values are for reference only):



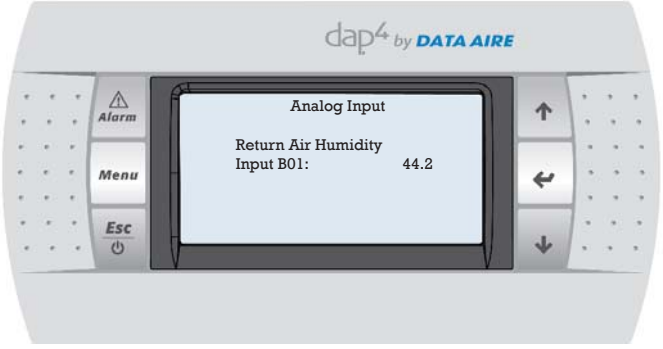
▼ Press the DOWN key to view the next screen.

The following will be displayed (values are for reference only):



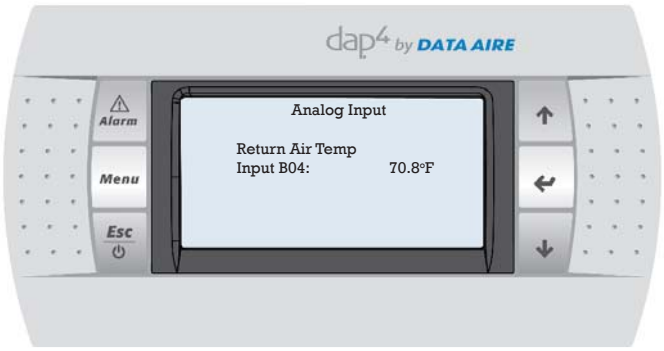
▼ Press the DOWN key to view the next screen.

The following will be displayed (values are for reference only):



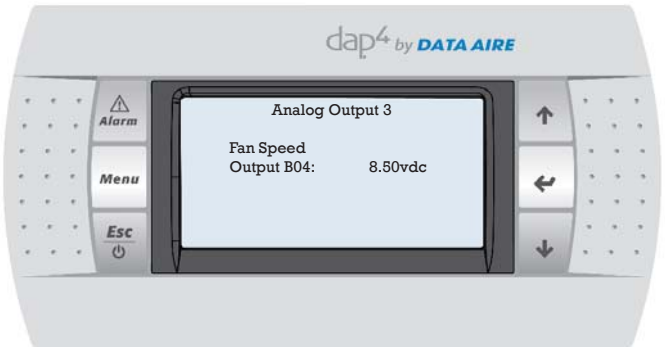
▼ Press the DOWN key to view the next screen.

The following will be displayed (values are for reference only):



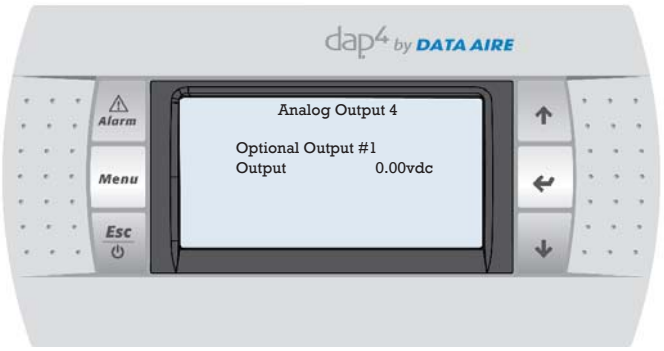
▼ Press the DOWN key to view the next screen.

The following will be displayed (values are for reference only):



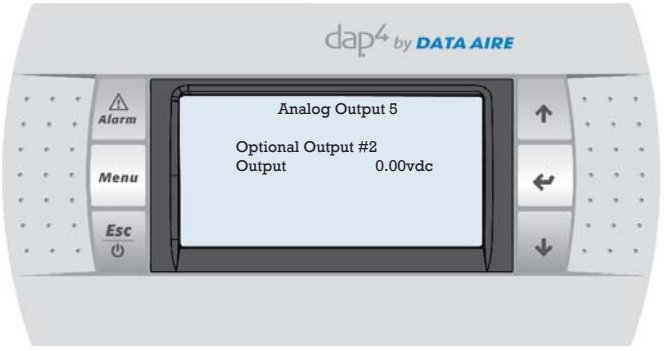
▼ Press the DOWN key to view the next screen.

The following will be displayed (values are for reference only):



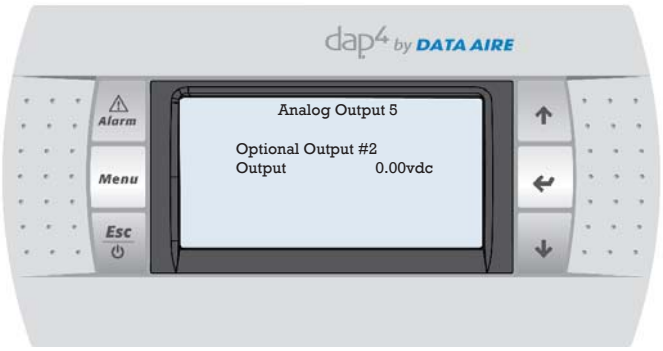
▼ Press the DOWN key to view the next screen.

The following will be displayed (values are for reference only):



▼ Press the DOWN key to view the next screen.

The following will be displayed (values are for reference only):



All screens have been viewed. BY pressing the UP or DOWN keys, the screens can be viewed.

▼ Press the MENU key to return to the main menu. Choose another menu by pressing the UP or DOWN keys or press ESC to return the main menu.

MENU E – Historical Data

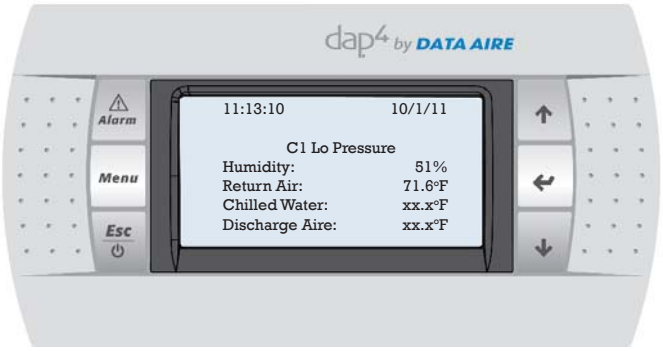
MENU E allows viewing alarms, component runtimes and resetting of component runtimes

The first screen will display (if any) alarm history

▼ Press the ENTER key to view

The following will be displayed (inputs are for reference only):

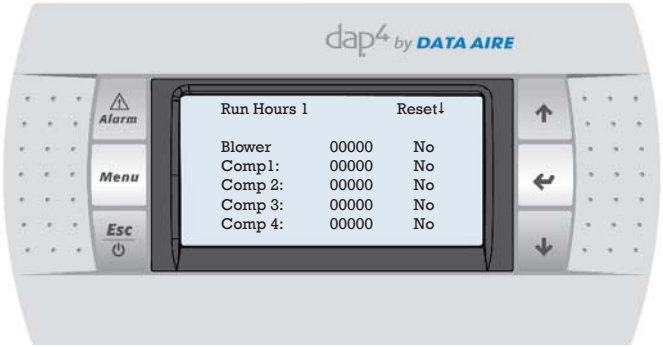
Time and Date of Alarm
Alarm Type
Humidity at time of occurrence
Chilled Water temperature at time of occurrence (if applicable)
Discharge Air Temperature at time of occurrence (if applicable)



To view consecutive alarms press the ENTER key moving the cursor into the screen area.

▼ Press the UP key and the display will show the previous alarm, with time and date. Continue to press the UP key to view all alarms. Once the last listed alarm is viewed, press the ENTER key to view run time (press the Esc key at any time to return to the Main Menu).

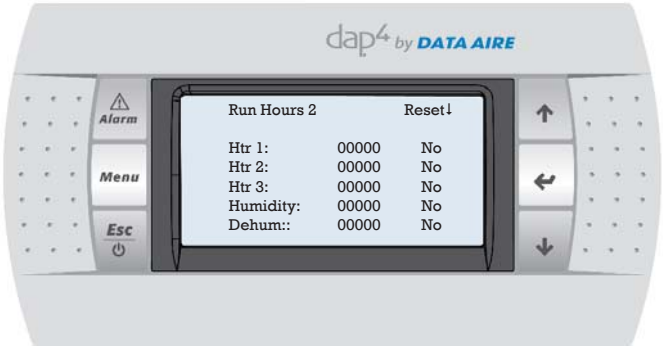
The screen will display the following:



▼ Press the ENTER key to move the cursor. The cursor will flash the reset choice of No or Yes. To reset and clear runtimes, press the UP or DOWN key.

▼ Press the ENTER key until the cursor is flashing on the title line. Press the DOWN key to move to next screen.

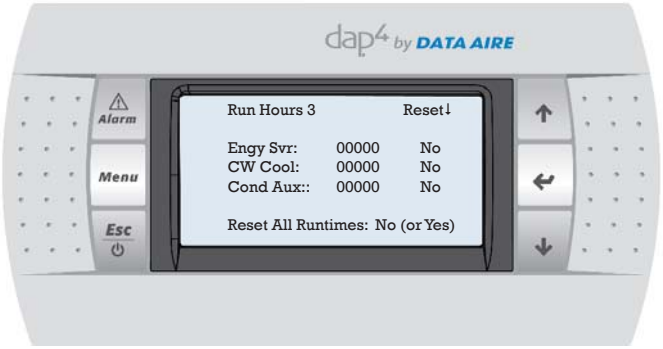
The screen will display the following:



▼ Press the ENTER key to move the cursor. The cursor will flash the reset choice of No or Yes. To reset and clear runtimes, press the UP or DOWN key.

▼ Press the ENTER key until the cursor is flashing on the title line. Press the DOWN key to move to next screen.

The screen will display the following:



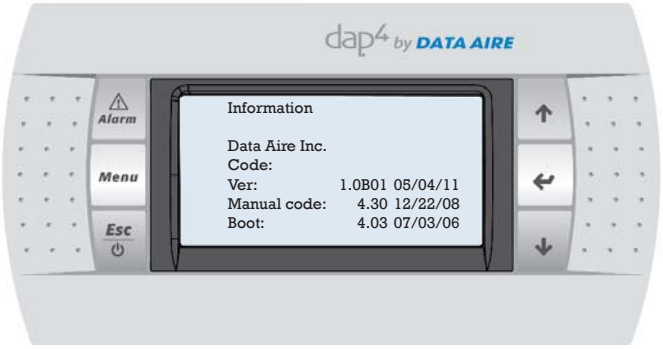
With the cursor flashing on the title line, press the UP or Down key to review the alarms or run-times or press the MENU key to return to the Main Menu.

▼ Press the Esc key to return to the normal operating screen.

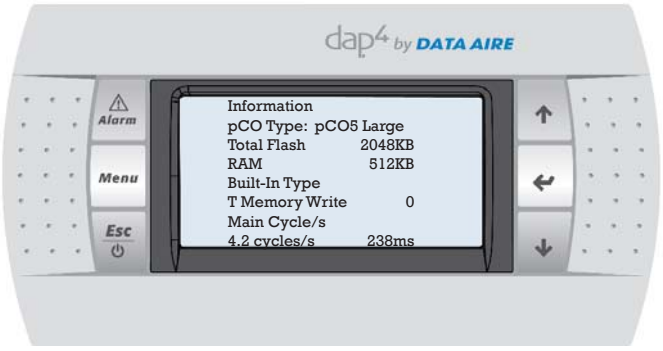
MENU F – INFORMATION

MENU F allows viewing of the processor version (Service Level password is required for entry). This is a view only menu.

Once password has been entered scroll until Menu F – Information is highlighted. Press the ENTER key to view. There two screens. The first screen will display the following:



▼ Press the UP or DOWN key to view second screen. The second screen will display the following:



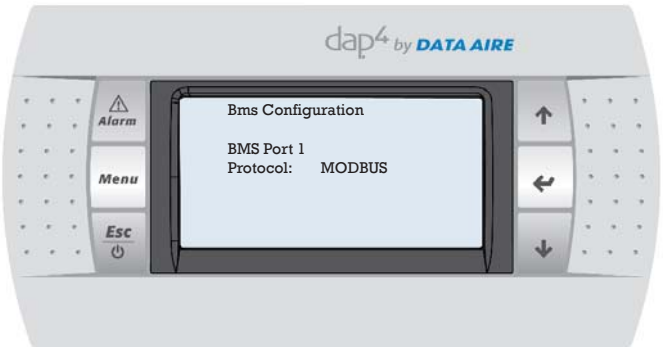
▼ Press the MENU key to return to the main menu or press Esc to return to the normal operating mode.

MENU G – NETWORK CONFIG

MENU G allows selection of BMS protocol. (Service Level password is required for entry)

Once password has been entered, press the UP or DOWN key until “G. Network Config” appears and is highlighted. Press the ENTER key.

The following will be displayed (values are for reference only):



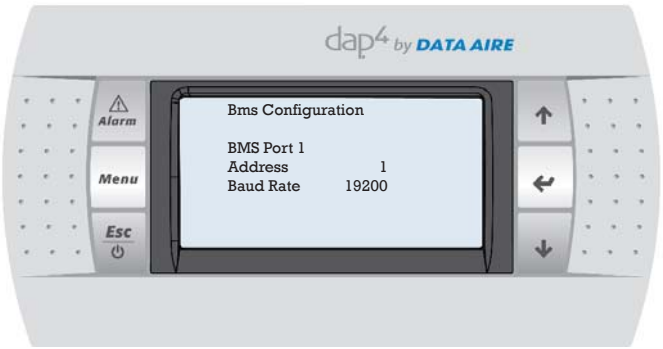
Only the protocol can be changed. The selections are as follows:

LON, BACNET, PCOLOAD, MODBUS, MODEM, CAREL, N/A

Once the selection has been made, press the ENTER key and the cursor will move to the title block.

To move to the next screen, press the DOWN key.

The following will be displayed (values are for reference only):



The address can be a value from 0 to 999

The available baud rates are: 1200, 2400, 4800, 9600, 19200

Once the selection has been made, press the ENTER key to move the cursor to the title block.

▼ Press the Esc key to return to the Main Menu. Scroll to the next menu to be viewed is highlighted or press the Esc again to return to the normal operating mode.

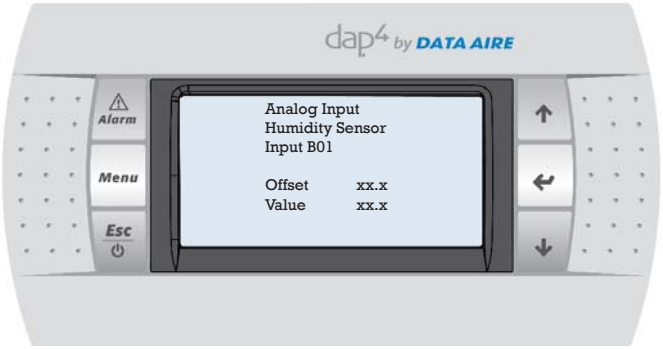
MENU H - CALIBRATE SENSORS

MENU H allows calibration of the unit installed sensors. Service Level password is required for entry.

Return air temperature and humidity sensors are standard with Data Aire units. Dependent on options and equipment type, a discharge air and chilled water sensor may be installed in the unit.

Press the UP or DOWN key until “H. Calibrate Sensors” appears and is highlighted. Press the ENTER key.

The following will be displayed on display module (values are for reference only):

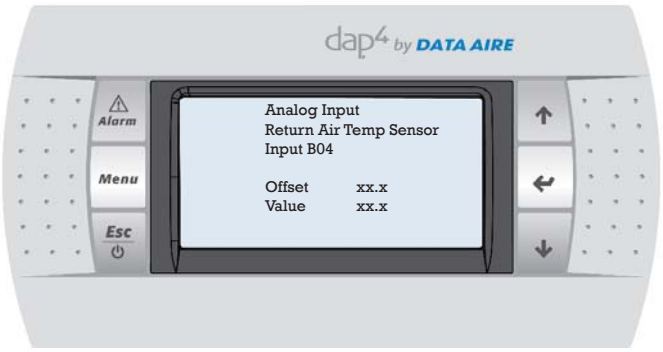


▼ Press the ENTER key to move the cursor. The cursor will flash at the Offset. By pressing the UP (to increase) or DOWN (to decrease) keys the Offset can be changed.

Once the change has been made, press the ENTER key and the cursor will move to the title block of the screen. The Offset change is now entered and stored.

To move to the next screen, press the DOWN key.

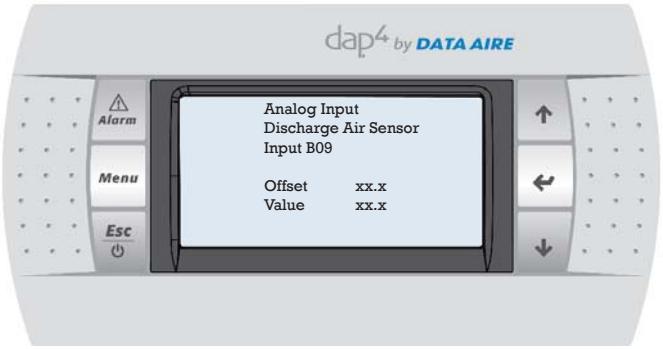
The following will be displayed (values are for reference only):



▼ Press the ENTER key to move the cursor. The cursor will flash at the Offset. By pressing the UP (to increase) or DOWN (to decrease) keys the Offset can be changed.

Once the change has been made, press the ENTER key and the cursor will move to the upper portion of the screen. The Offset change is now entered and stored.

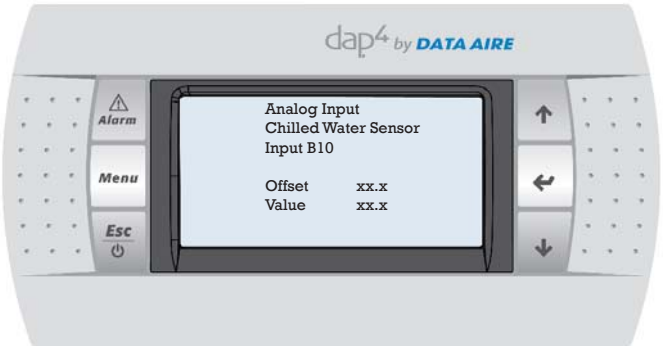
To move to the next screen, press the DOWN key.



The following will be displayed (values are for reference only):
▼ Press the ENTER key to move the cursor. The cursor will flash at the Offset. By pressing the UP (to increase) or DOWN (to decrease) keys the Offset can be changed.

Once the change has been made, press the ENTER key and the cursor will move to the upper portion of the screen. The Offset change is now entered and stored.

To move to the next screen, press the DOWN key.



The following will be displayed (values are for reference only):
▼ Press the ENTER key to move the cursor. The cursor will flash at the Offset. By pressing the UP (to increase) or DOWN (to decrease) keys the Offset can be changed.

Once the change has been made, press the ENTER key and the cursor will move to the upper portion of the screen. The Offset change is now entered and stored.

▼ Press the Up or DOWN key to move to another screen or if all calibrations are completed, with the cursor flashing in the title box, press the Esc key. This will take you to the Main Menu.

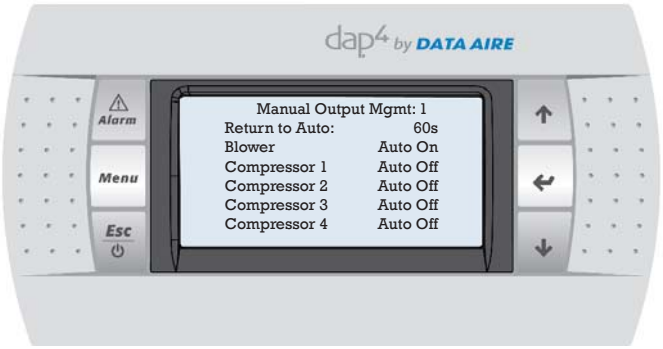
Use the UP or DOWN keys to scroll through the Menus or press the Esc key to return to the normal operating mode screen.

MENU I – MANUAL CONTROL

MENU I allows manually running different unit components (the Service Level password is required for entry).

In the Main Menu screen press the UP or DOWN key until “I. Manual Control” appears and is highlighted. Press the ENTER key.

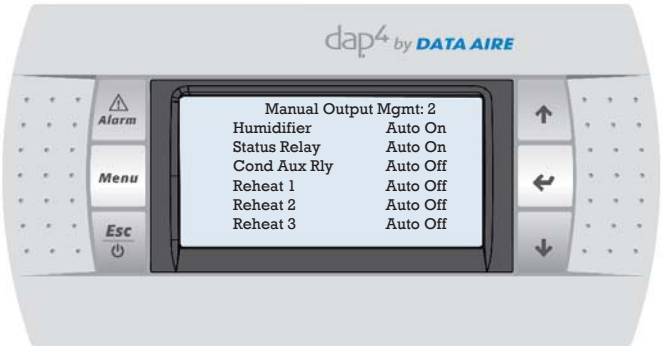
The following will be displayed(values are for reference only):



Note: The “Return to Auto:” is programmable from 10 to 300 seconds. Once the time has elapsed the functions will return to normal programmed operation.

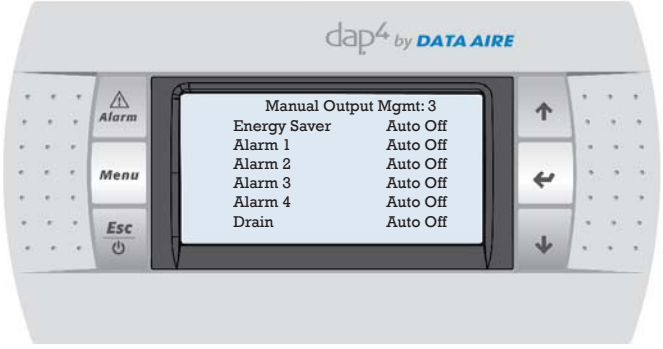
Move the cursor to the title block by pressing the ENTER key. To return to the Main Menu press the Esc key or to view the following screen press the DOWN key.

The following will be displayed(values are for reference only):

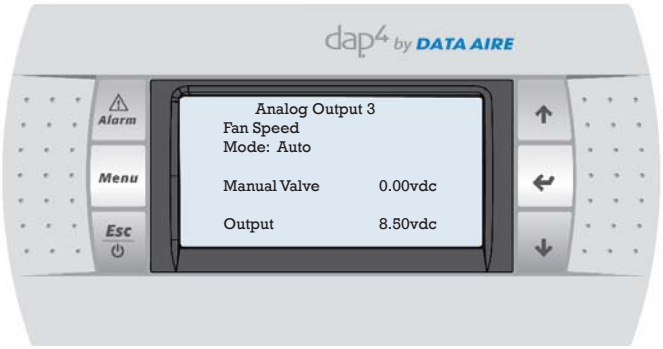


Move the cursor to the title block by pressing the ENTER key. To return to the Main Menu press the Esc key or to view the following screen press the DOWN key.

The following will be displayed(values are for reference only):

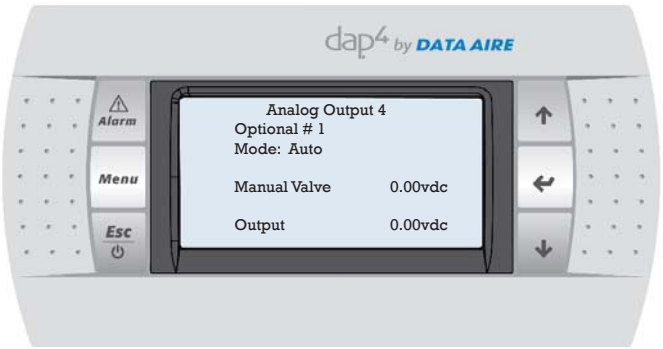


Move the cursor to the title block by pressing the ENTER key. To return to the Main Menu press the Esc key or to view the following screen press the DOWN key.
The following will be displayed(values are for reference only):



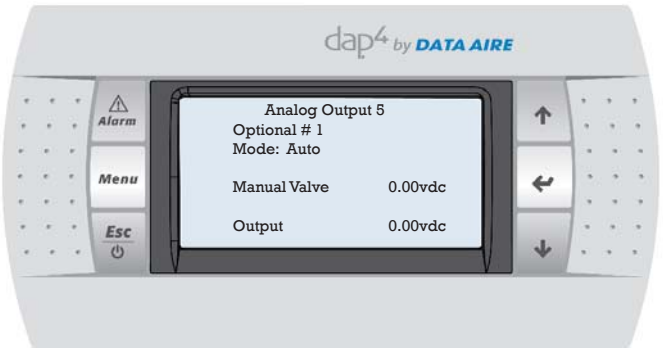
Move the cursor to the title block by pressing the ENTER key. To return to the Main Menu press the Esc key or to view the following screen press the DOWN key.

The following will be displayed (values are for reference only):



Move the cursor to the title block by pressing the ENTER key. To return to the Main Menu press the Esc key or to view the following screen press the DOWN key.

The following will be displayed(values are for reference only):



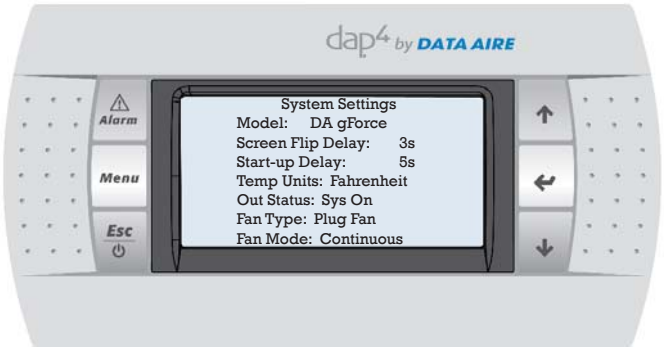
Move the cursor to the title block by pressing the ENTER key. To return to the Main Menu or press the Esc key.

MENU J – FACTORY SETTINGS (factory use only)

MENU J is for setting the control to the type equipment and options ordered. **This requires the Factory Level password and entry should be limited to Data Aire factory and service personnel.**

In the main menu screen press the UP or DOWN key until “J. Factory Settings” appears and is highlighted. Press the ENTER key.

The following will be displayed:



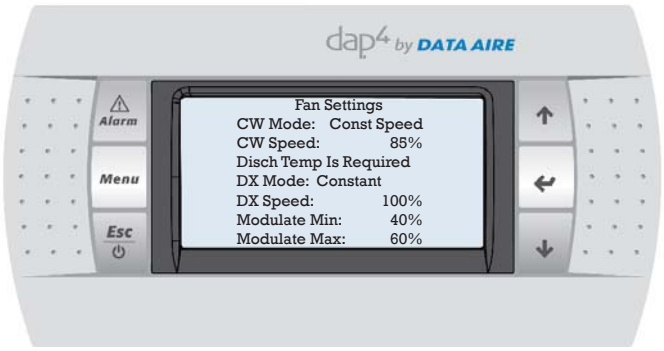
The inputs are for reference only (see below for available settings).

Model:	There are four choices – gForce, Mini, Mini-Plus and DA Series
Screen Flip Delay:	The range is 0 to 99 seconds (in 1 second intervals)
Start-up Delay:	The range is 5 to 600 seconds (in 1 second intervals)
Temp Units:	Fahrenheit or Centigrade
Out Status:	There are five choices – Sys On, Dehum On, Hum On, Comps On, and Re heat On
Fan Type:	There are two settings – Plug Fan, Std On/Off
Fan Mode:	There are two choices - Continuous and Automatic

Once inputs have been made, move the cursor (by pressing the ENTER Key) to the title box.

Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only/see below for available settings):



Fan Settings *(Plug Fan Only – Fan Type in first screen must be set for PLUG FAN)*

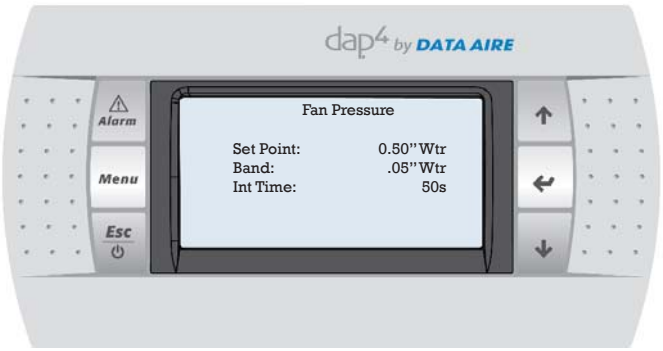
CW Mode: There are four settings Constant, BMS, Valve Pos, and Pressure
CW Speed: The range is 60 to 100%
Disch Temp Is Required
DX Mode: There are three available choices – Constant, BMS and Pressure
DX Speed: The range is 60 to 100%
Modulate Min: The range is 40 to 100%
Modulate Max: The range is 70 to 100%

If choosing CONSTANT, the following will be displayed and a value can entered:
CW Speed: 60% - 100%
If choosing BMS, no additional messages will be displayed
If choosing VALVE POS, the following will be displayed and a values can be entered:
Modulate Min: 40% - 100%
Modulate Max: 70% - 100%
If choosing AIR PRESSURE, the following will be displayed and values can be entered:
Modulate Min: 40% - 100%
Modulate Max: 70% - 100%
With DX, if choosing PRESSURE, the following will be displayed and values can be entered:
Air Pressure Setpoint: 0.01 – 0.99” Wtr
Band: 0.01 – 0.99” Wtr
Int Time: 0 – 999s

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Available Selections

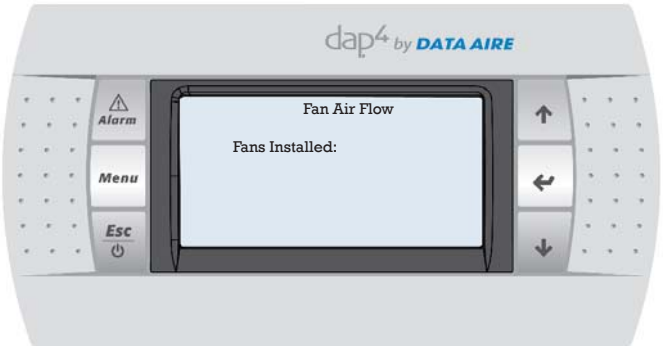
Set Point: 0.00” to 0.99”

Band: .01” to .99”

Int Time: 0 – 999

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key or press the Esc key to return to normal operating mode

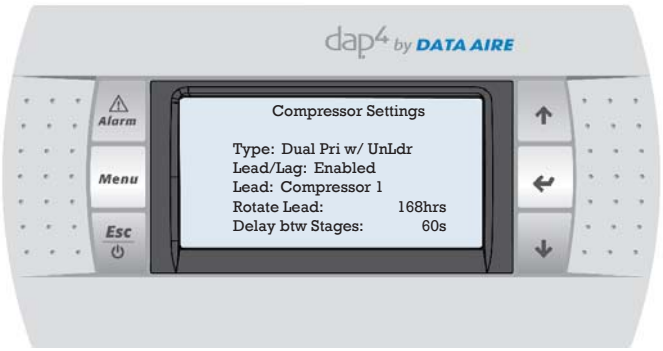
▼ Press the DOWN key to view the next screen:



Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (inputs are for reference only)
Available Selections:



Type: Sngl Primary (single scroll compressor),
Dual Primary (dual scroll compressor),
Sngl Pri w/UnLdr (single semi-hermetic compressor w/unloading),
Dual Pri w/UnLdr (dual semi-hermetic compressors w/unloading)
Four Tandem (dual tandem scroll compressors)
None (entry for chilled water units)

Lead/Lag: Enabled or Disabled (if Disabled is selected, Lead: and Rotate Lead: are not displayed)

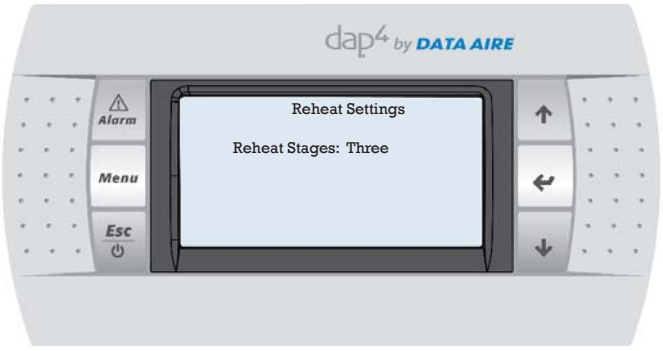
Rotate Lead: Range is from 12 to 999 hours (of runtime to rotate compressor lead – factory setting 168 hrs)

Delay Btw Stages: Range is from 30 to 300 seconds (delay between start of lag compressor)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

Press the DOWN key to view the next screen:

The following will be displayed (inputs are for reference only):



Available Selections

One, two, three or none

If two or three are selected, the display module will display “Lead Reheat:”

By pressing the UP or DOWN key the lead choices (First, Second or Third) can be seen.

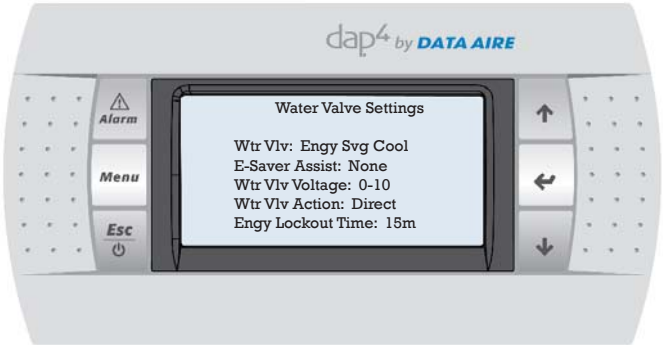
With two stage reheat, pick either First or Second (factory setting is First)

With three stage reheat, pick either First, Second or Third (factory setting is First)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

Press the DOWN key to view the next screen:

The following will be displayed (inputs are for reference only):



Available Selections

Wtr Vlv (Water Valve):	Engy Svg Cool	Chilled Wtr Cool
	Chilled Wtr Reg	Aux Chill Wtr
	None	

Note: If None is selected, Wtr Vlv Voltage, Wtr Vlv Action and Engy Lockout Time will appear on the display module screen.

E-Saver Assist: None
1 Comp*
2 Comp*
4 Comp*

* If E-Saver Assist is selected with 1, 2 or 4 compressors, the display module will display “Disch Temp Is Required”. An optional discharge temperature sensor is required. If left at none, there will be no message.

Note: E-Saver Assist will only appear if either Engy Svg Cool or Aux Chill Wtr are selected.

Wtr Vlv Voltage: 0 – 10 (factory setting)
4 – 7
6 – 9
7 – 10
2 – 10

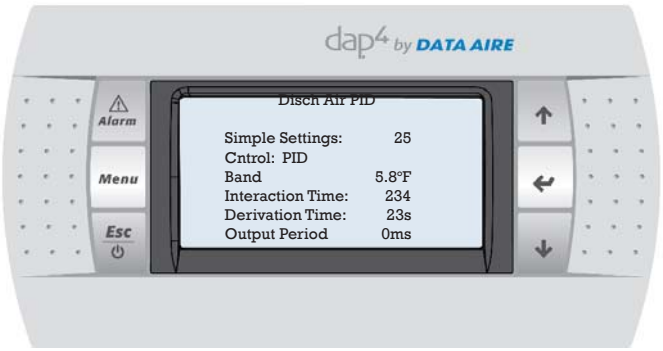
Wtr Vlv Action: Direct (factory setting) or Reverse

Engy Lockout Time: 15m (factory setting), 30m, 45m, and 60m

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

Press the DOWN key to view the next screen:

The following will be displayed (inputs are for reference only):



Available Selections

Simple Setting: 0 – 300 (factory setting is 25)

Control: PID
P + 1
P

Notes:
If selecting PID, the Band, Integration Time, Derivative Time and Output Period will appear on the screen and values can be entered.

If selecting P + 1, the Band, Integration Time and Output Period will appear on the screen and values can be entered.

If selecting P, the Band and Output Period will appear on the screen and values can be entered.

Band: The range is 1 to 35°F

Integration Time: The range is 0 to 999 seconds

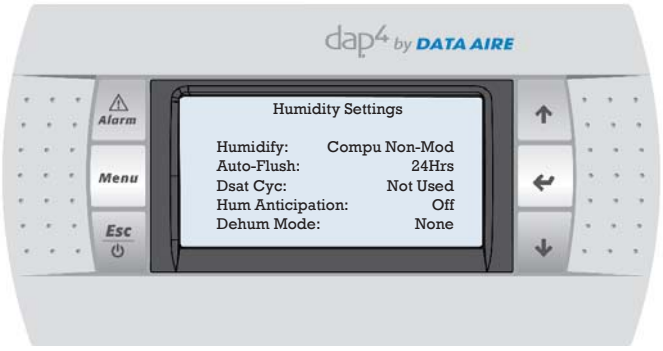
Derivative Time: The range is 0 to 999 seconds

Output Period: The range is 0 to 9999 ms (milliseconds)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key or press the Esc key to return normal operating mode

Press the DOWN key to view the next screen:

The following will be displayed (inputs are for reference only):
Available Selections



Humidify: Compu Non-Mod (Computer Room, Non-Modulating)
Computer Mod (Computer Room, Modulating)
Comf Non-Mod (Comfort, Non-Modulating)
Comf Mod (Comfort, Modulating)
None

Auto-Flush: Not Used or 12, 24, 48 or 96 Hrs (only available on units with infrared humidifier)

Dsat Cyc: Not Used or 1, 2, 3, 4 or 5 M Off (Minutes)

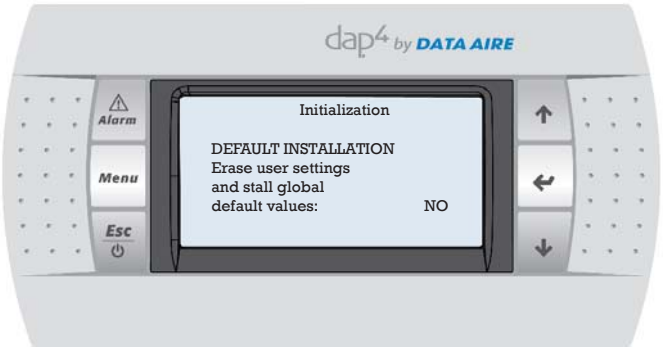
Hum Anticipation: On or Off

Dehum Mode: None
1C In Limit (1 compressor & within reheat limits)
2C In Limit (2 compressors & within reheat limits)
1C No Limit (1 compressor & no reheat limits)
2C No Limit (2 compressors & no reheat limits)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key or press the Esc key to return normal operating mode

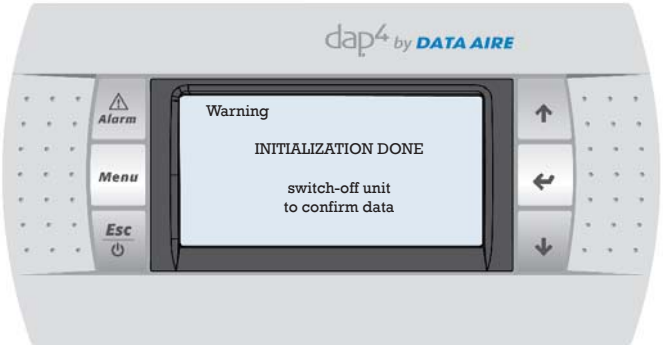
Press the DOWN key to view the next screen:

The following will be displayed (input is for reference only):
Available Selections: Yes or No



Note: Selecting YES will reset all values back to the factory settings (default).

If YES is selected, the following message will be displayed: “wait resetting” (resetting will take a few seconds). Once set the display will have the following message:



Power down the unit using the unit mounted electrical disconnect or the (field provided) wall mounted disconnect.

Once the self-test is complete, the display module will display that the unit is “OFFbyKEY”

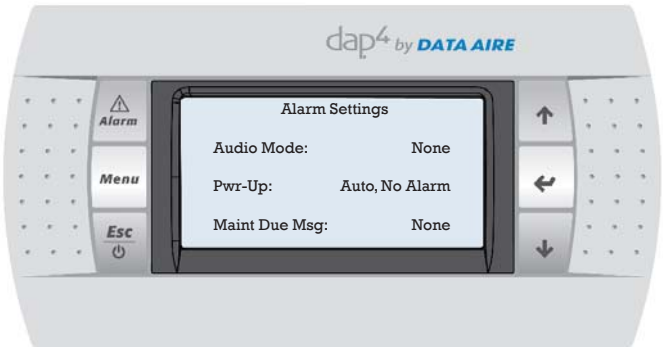
Start (power-up) the unit following the instructions on page 10, Powering the Unit ON/OFF.

MENU K – ALARMS and LIMITS

MENU K is for setting the control alarms and limits. This requires the Service Level password and entry should be limited to service personnel starting or servicing the equipment.

In the Main Menu screen press the UP or DOWN key until “K. Alarms & Limits” appears and is highlighted. Press the ENTER key.

The following will be displayed (inputs are for reference only):

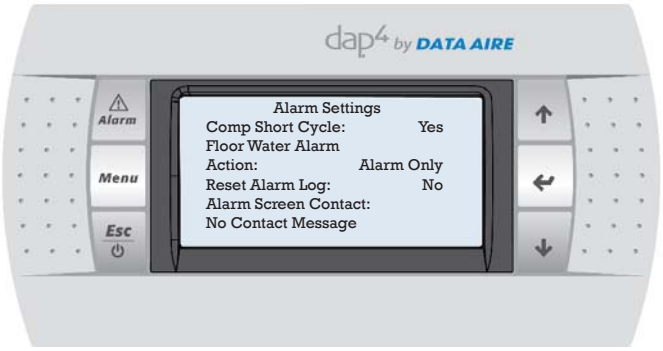


Available Selections

Audio Mode:	None Full On Long Beep Short Beep
Pwr-Up:	Auto, No Alarm Auto, With Alarm Man, Clr Alarm
Maint Due Msg:	None The range is 0 to 1000 hours

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:



The following will be displayed (values are for reference only):

Available Selections

Comp Short Cycle: Yes or No

Water Alarm Action: Alarm Only
Shutdown Unit
Lockout Comps

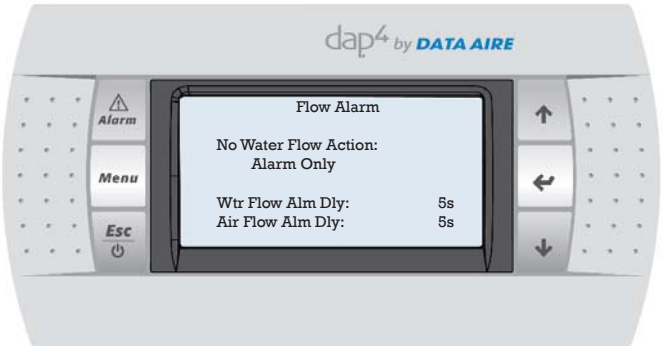
Reset Alarm Log: Yes or No

Alarm Screen Contact: No Contact Message
Service Company
Maint Engineer
Data Proc Mngr
Custom Message (factory installed)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Available Selections

No Water Flow Action: Alarm Only
Turn Compressors Off

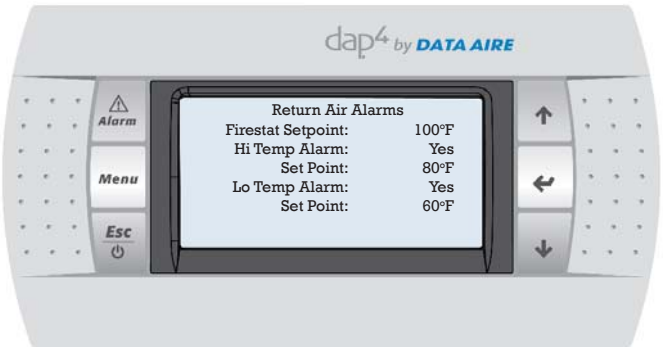
Wtr Flow Alm Dly: The range is 5 to 180 seconds

Air Flow Alm Dly: The range is 5 to 180 seconds

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Available Selections

Firestat Setpoint: The range is 100 to 150°F (factory setting is 100°F)

Hi Temp Alarm: Yes or No (factory setting is Yes)

Set Point: The range is 70 to 90°F (factory setting is 80°F)

Lo Temp Alarm: Yes or No (factory setting is Yes)

Set Point: The range is 55 to 75°F (factory setting is 60°F)

Note: If No is selected for the Hi or Lo Temp Alarm, the Set Point will not be displayed.

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

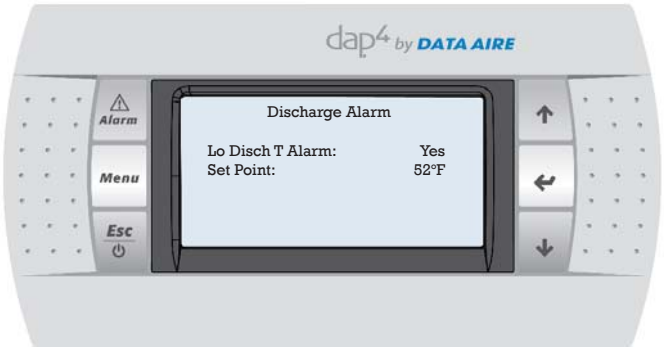
▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

Available Selections

Lo Disch T Alarm: Yes or No

If Yes is selected, the following will be displayed (value is for reference only):

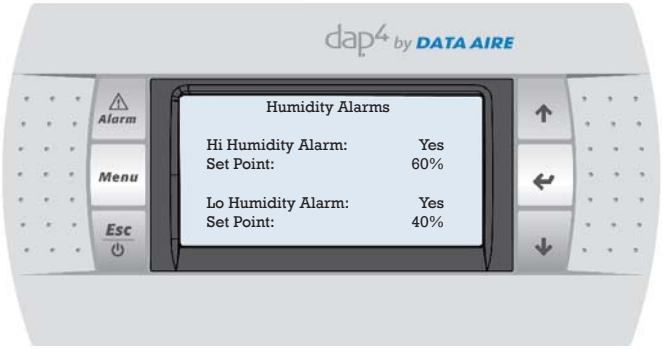


The Set Point range is 45 to 60°F (factory setting is 52°F)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Available Selections

Hi Humidity Alarm: Yes or No (factory setting is Yes)

Set Point: The range is 35 to 90% RH (factory setting is 60% RH)

Lo Humidity Alarm: Yes or No (factory setting is Yes)

Set Point: The range is 10 to 65% RH (factory setting is 40% RH)

Note: If No is selected for the Hi or Lo Humidity Alarm, the Set Point will not be displayed.

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

Available Selections

Alarm #1: SEE TAG INSIDE DOOR
Custom Message
FAN MOTOR OVERLOAD
CHK HUMIDIFIER CYL
STANDBY PUMP ON
UPS ON-CHK MAIN POWER
UNIT IN STBY
REHEAT & HUM INHIBIT
HUMIDIFIER INHIBITED
REHEAT INHIBITED

Alarm #2: SEE TAG INSIDE DOOR
Custom Message
FAN MOTOR OVERLOAD
CHK HUMIDIFIER CYL
STANDBY PUMP ON
UPS ON-CHK MAIN POWER
UNIT IN STBY
REHEAT & HUM INHIBIT
HUMIDIFIER INHIBITED
REHEAT INHIBITED

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

Available Selections

Alarm #3: SEE TAG INSIDE DOOR
Custom Message
FAN MOTOR OVERLOAD
CHK HUMIDIFIER CYL
STANDBY PUMP ON
UPS ON-CHK MAIN POWER
UNIT IN STBY
REHEAT & HUM INHIBIT
HUMIDIFIER INHIBITED
REHEAT INHIBITED

Alarm #4: SEE TAG INSIDE DOOR
Custom Message
FAN MOTOR OVERLOAD
CHK HUMIDIFIER CYL
STANDBY PUMP ON
UPS ON-CHK MAIN POWER
UNIT IN STBY
REHEAT & HUM INHIBIT
HUMIDIFIER INHIBITED
REHEAT INHIBITED

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

Alarm Output Function 1 - See sample screen shot at end of section

	Alarm 1	Alarm 2	Alarm 3	Alarm 4
CW Sensor	Yes or No	Yes or No	Yes or No	Yes or No
DA Sensor	Yes or No	Yes or No	Yes or No	Yes or No
Fan Ovld	Yes or No	Yes or No	Yes or No	Yes or No
Smoke	Yes or No	Yes or No	Yes or No	Yes or No
Cond Wtr	Yes or No	Yes or No	Yes or No	Yes or No
Firestat	Yes or No	Yes or No	Yes or No	Yes or No

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

Alarm Output Function 2 - See sample screen shot at end of section

	Alarm 1	Alarm 2	Alarm 3	Alarm 4
C1 Hi Pr	Yes or No	Yes or No	Yes or No	Yes or No
C1 Low Pr	Yes or No	Yes or No	Yes or No	Yes or No
C2 Hi Pr	Yes or No	Yes or No	Yes or No	Yes or No
C2 Low Pr	Yes or No	Yes or No	Yes or No	Yes or No
Short Cycl	Yes or No	Yes or No	Yes or No	Yes or No
Maint Tmr	Yes or No	Yes or No	Yes or No	Yes or No

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

Alarm Output Function 3 - See sample screen shot at end of section

	Alarm 1	Alarm 2	Alarm 3	Alarm 4
Hi Humid	Yes or No	Yes or No	Yes or No	Yes or No
Low Humid	Yes or No	Yes or No	Yes or No	Yes or No
Humidifier	Yes or No	Yes or No	Yes or No	Yes or No
DA Low T	Yes or No	Yes or No	Yes or No	Yes or No
RA Low T	Yes or No	Yes or No	Yes or No	Yes or No
RA Hi Temp	Yes or No	Yes or No	Yes or No	Yes or No

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

Alarm Output Function 4 - See sample screen shot at end of section

	Alarm 1	Alarm 2	Alarm 3	Alarm 4
Override	Yes or No	Yes or No	Yes or No	Yes or No
Air Flow	Yes or No	Yes or No	Yes or No	Yes or No
Wtr Flow	Yes or No	Yes or No	Yes or No	Yes or No
Power Up	Yes or No	Yes or No	Yes or No	Yes or No
Floor Wtr	Yes or No	Yes or No	Yes or No	Yes or No
Hum Inhbt	Yes or No	Yes or No	Yes or No	Yes or No

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

Alarm Output Function 5 - See sample screen shot at end of section

	Alarm 1	Alarm 2	Alarm 3	Alarm 4
Heat Inhbt	Yes or No	Yes or No	Yes or No	Yes or No
Filter	Yes or No	Yes or No	Yes or No	Yes or No
Alm SW 1	Yes or No	Yes or No	Yes or No	Yes or No
Alm SW 2	Yes or No	Yes or No	Yes or No	Yes or No
Alm SW 3	Yes or No	Yes or No	Yes or No	Yes or No
Alm SW 4	Yes or No	Yes or No	Yes or No	Yes or No

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

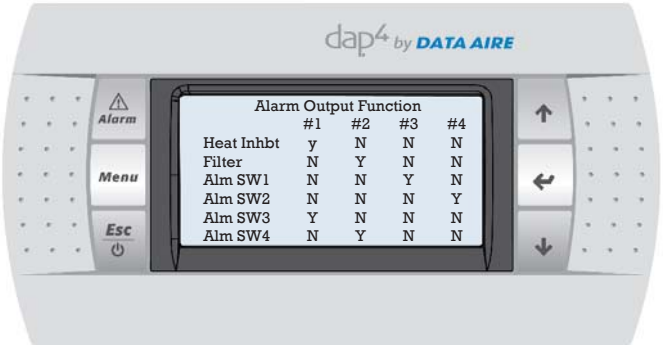
▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

Alarm Output Function 6 - See sample screen shot at end of section

	Alarm 1	Alarm 2	Alarm 3	Alarm 4
Manl Ovrd	Yes or No	Yes or No	Yes or No	Yes or No

Sample of screen shots for Alarm Output Function 1-6.

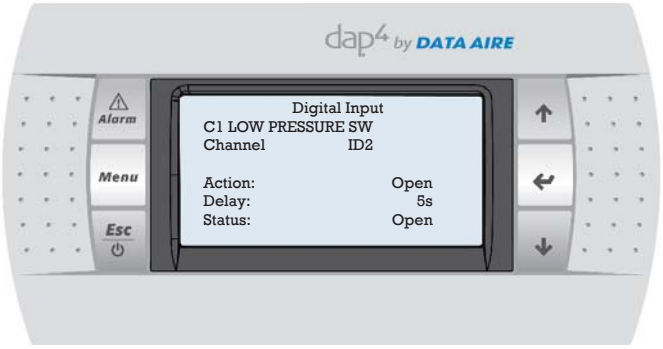

dap4 by DATA AIRE
Alarm
Menu
Esc
Alarm Output Function
#1 #2 #3 #4
Heat Inhbt y N N N
Filter N Y N N
Alm SW1 N N Y N
Alm SW2 N N N Y
Alm SW3 Y N N N
Alm SW4 N Y N N

MENU L - Configure I/O *(factory use only)*

Menu L is a factory for configuring the unit's digital inputs and the unit's analog inputs and outputs. **This requires the Factory Level password and entry should be limited to Data Aire factory and service personnel.**

▼ Press the UP or DOWN key until "L. Configure I/O" appears and is highlighted. Press the ENTER key.

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

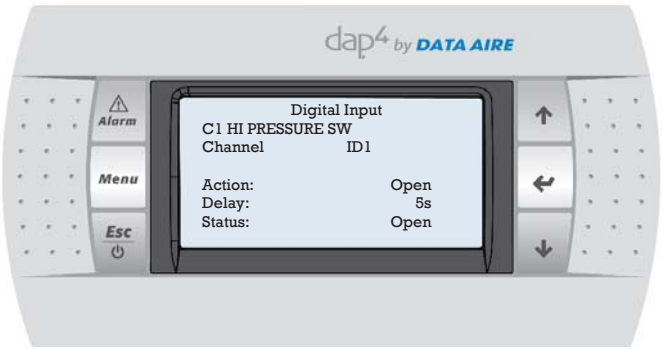
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

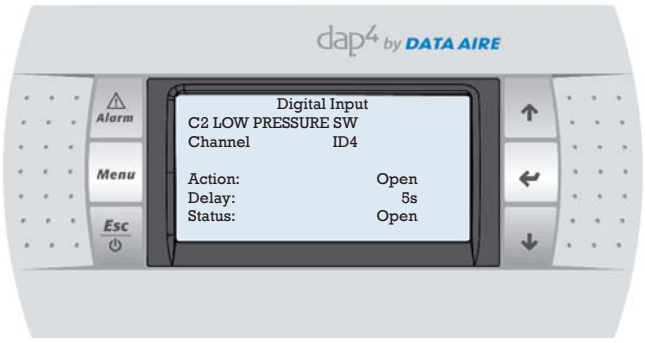
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

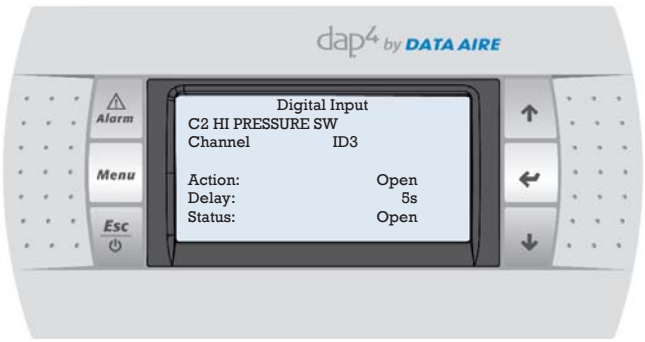
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):
Move the cursor by pressing the ENTER key. Move the cursor to change the setting.



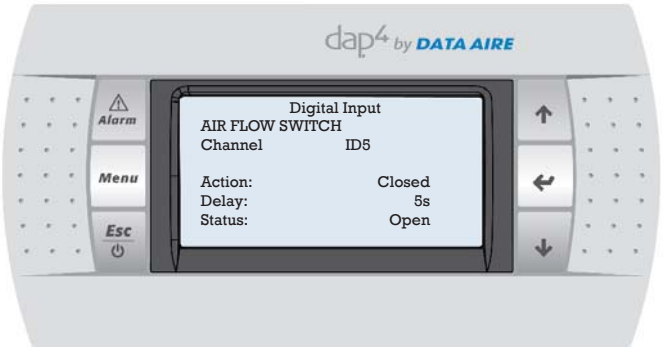
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

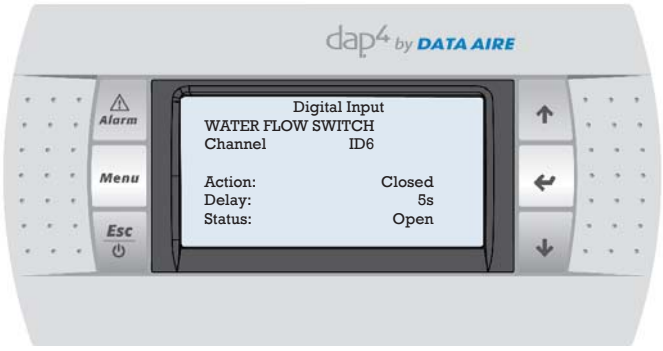
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

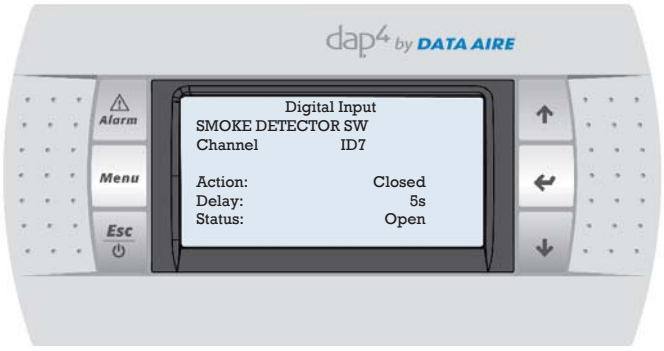
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

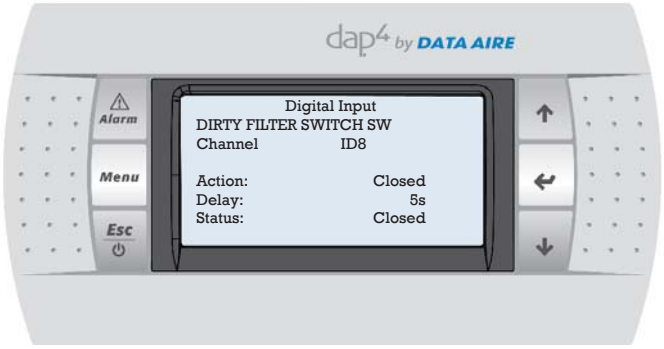
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

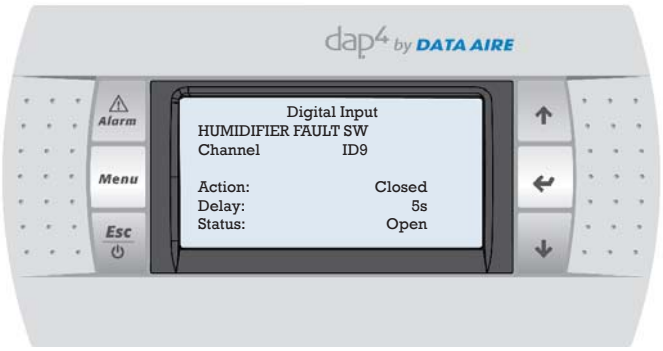
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

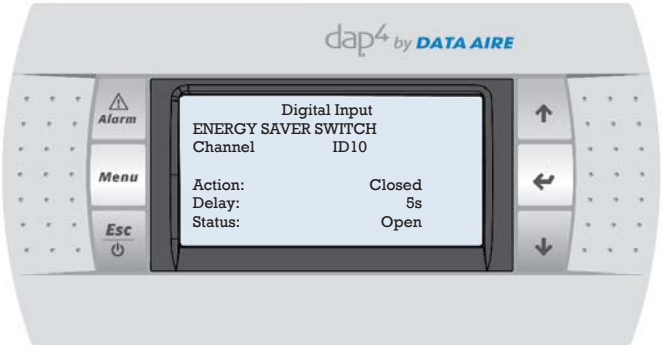
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

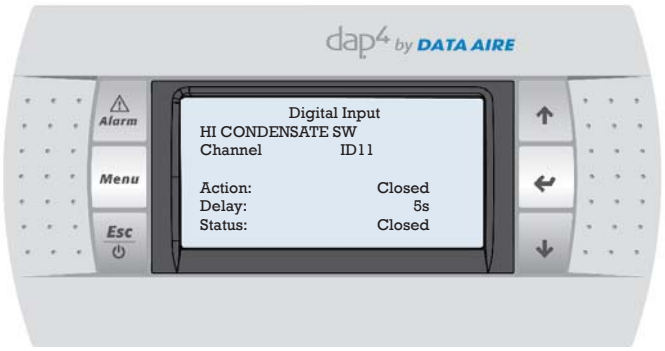
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

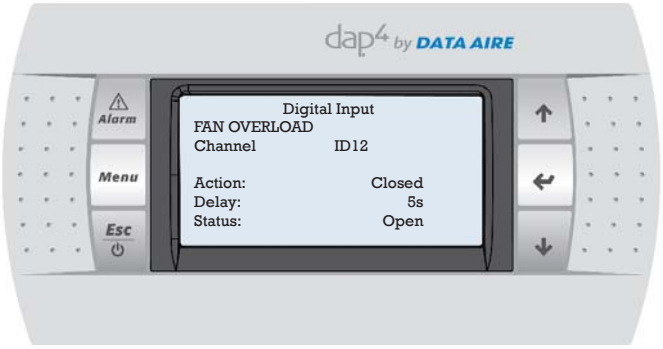
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

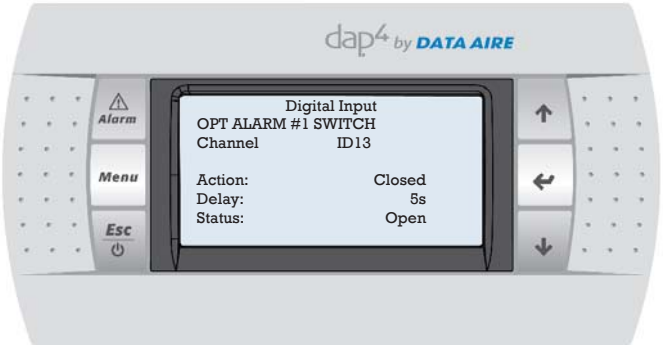
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

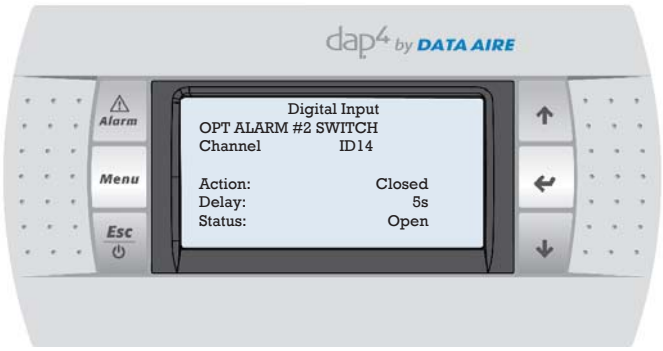
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

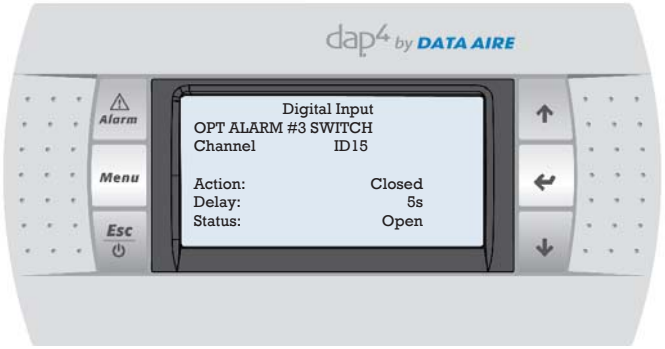
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

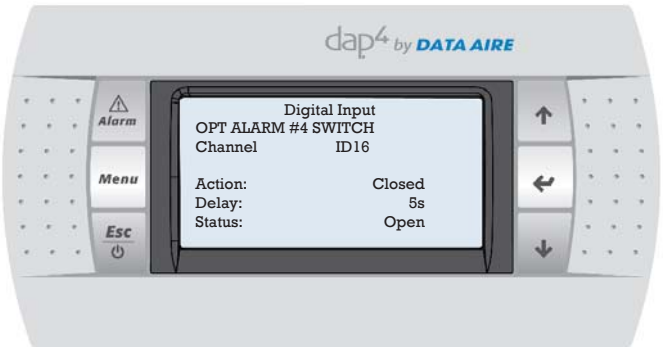
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

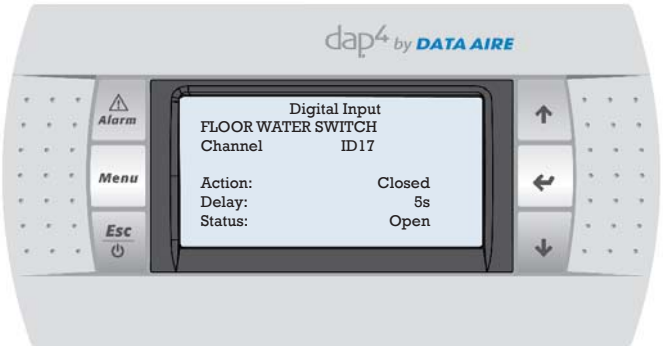
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):
Move the cursor by pressing the ENTER key. Move the cursor to change the setting.



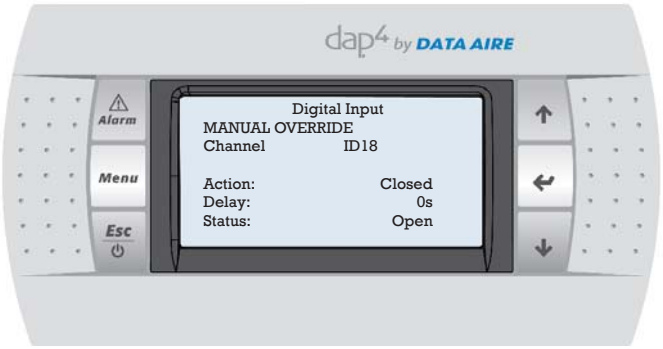
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

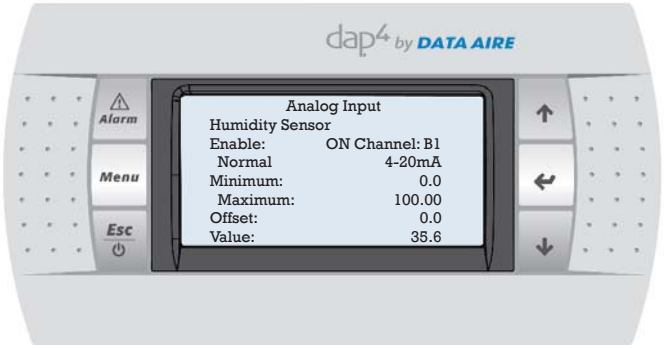
The following can be changed by pressing the DOWN key:

Channel – Open or Closed
Delay – the range is 0 – 999 seconds
Status – Open or Closed (Status can't be changed.)

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

The following can be changed by pressing the DOWN key:

Enable – ON or OFF

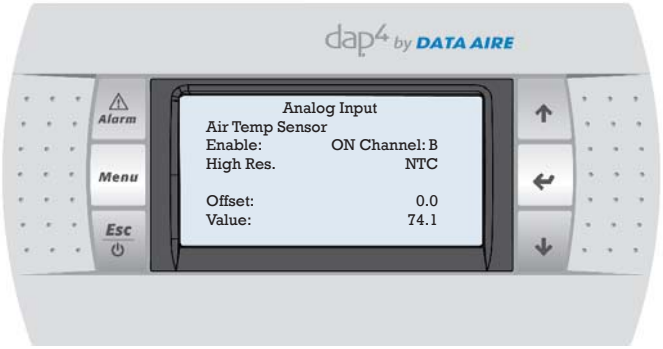
Note: If (Enable) OFF is selected the Normal, Minimum, Maximum, Offset and Value will not be displayed.

With Enable ON, Normal, Minimum, Maximum, Offset and Value will be displayed and values changed.

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

The following can be changed by pressing the DOWN key:

Enable – ON or OFF

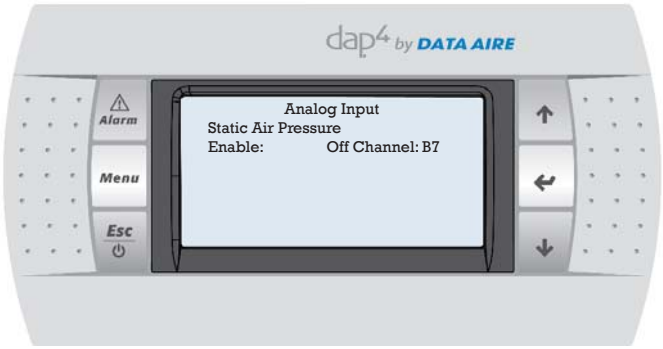
Note: If (Enable) OFF is selected the High Res, Offset and Value will not be displayed.

With Enable ON, High Res., Offset and Value will be displayed and values changed.

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



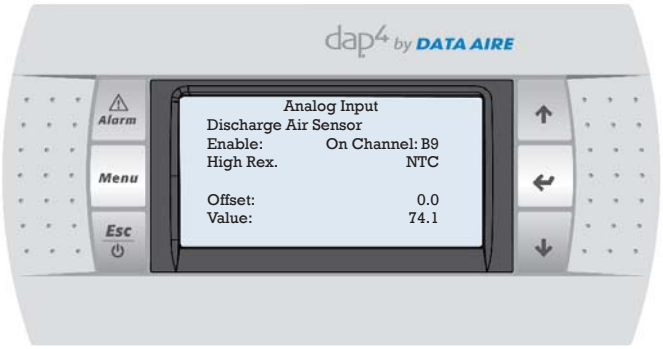
Note: If (Enable) OFF is selected the Normal, Minimum, Maximum, Offset and Value will not be displayed.

With Enable ON, Normal, Minimum, Maximum, Offset and Value will be displayed and values changed.

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



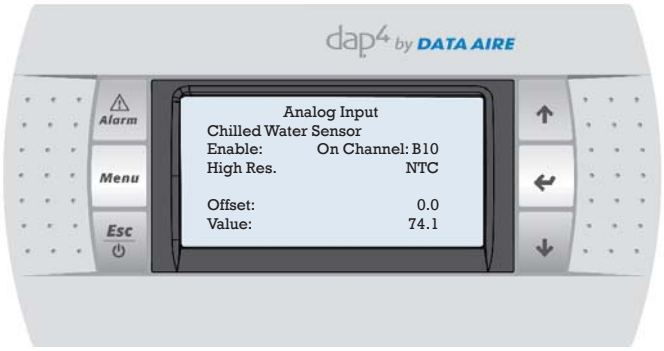
Note: If (Enable) OFF is selected the High Res, Offset and Value will not be displayed.

With Enable ON, High Res., Offset and Value will be displayed and values changed.

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Note: If (Enable) OFF is selected the High Res, Offset and Value will not be displayed.

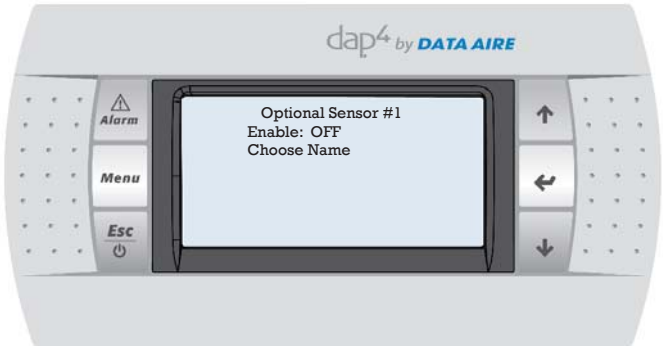
With Enable ON, High Res., Offset and Value will be displayed and values changed.

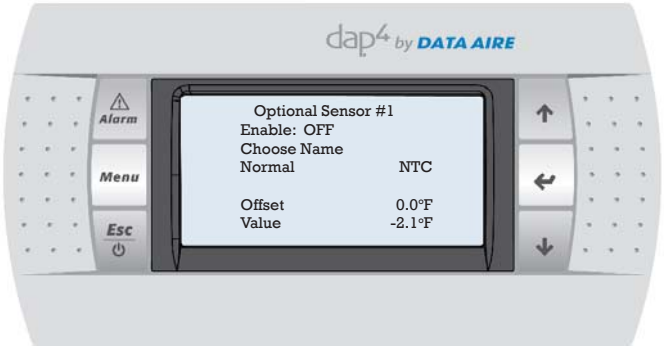
Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):

With Enable OFF





With Enable ON

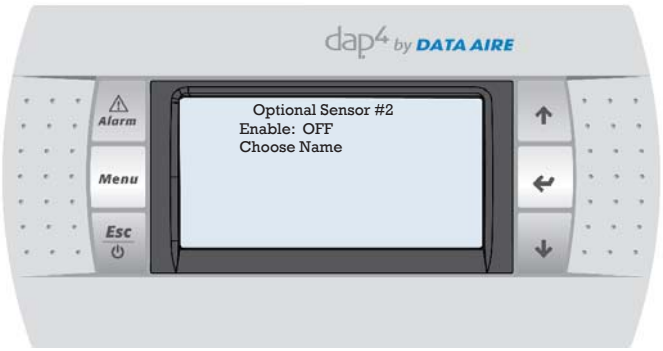
The “Choose Name” allows one of the following to be selected by moving the cursor to the Choose Name and pressing the UP or DOWN key:

Diff Pressure	Suct Pressure	Disch Pressure	Outside Hum	Outside Temp	Zone Humidity
Zone Air Temp	CW Flow	Cond Wtr Flow	Ret Air Temp	Sply Air Temp	CW Ret Temp
CW Sply Temp	Cond Ret Temp	Cond Sup Temp	Power	Frequency	Ground Amps
Neutral Amps	Output Amps C	Output Amps B	Output Amps A	Input Amps C	Input Amps B
Input Amps A	Output V. B-C	Output V. A-C	Output V. A-B	Input V. B-C	Input V. A-C
Input V. A-B					

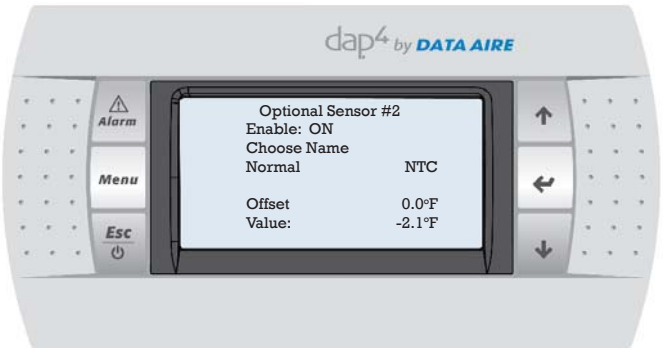
Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



With Enable OFF



With Enable ON

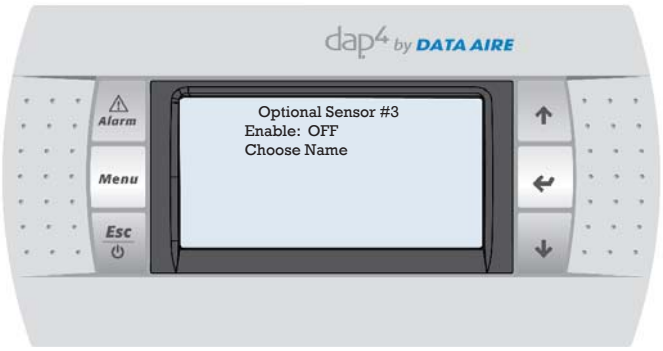
The “Choose Name” allows one of the following to be selected by moving the cursor to the Choose Name and pressing the UP or DOWN key:

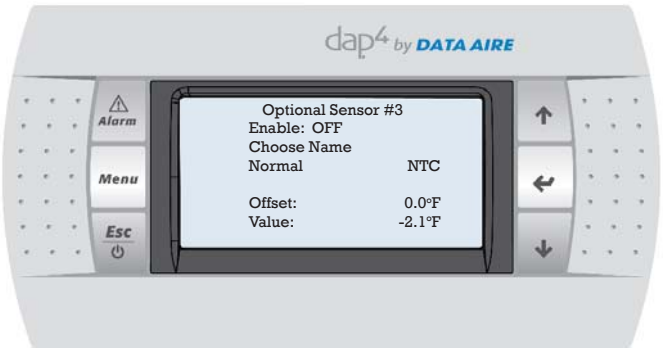
Diff Pressure	Suct Pressure	Disch Pressure	Outside Hum	Outside Temp	Zone Humidity
Zone Air Temp	CW Flow	Cond Wtr Flow	Ret Air Temp	Sply Air Temp	CW Ret Temp
CW Sply Temp	Cond Ret Temp	Cond Sup Temp	Power	Frequency	Ground Amps
Neutral Amps	Output Amps C	Output Amps B	Output Amps A	Input Amps C	Input Amps B
Input Amps A	Output V. B-C	Output V. A-C	Output V. A-B	Input V. B-C	Input V. A-C
Input V. A-B					

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):





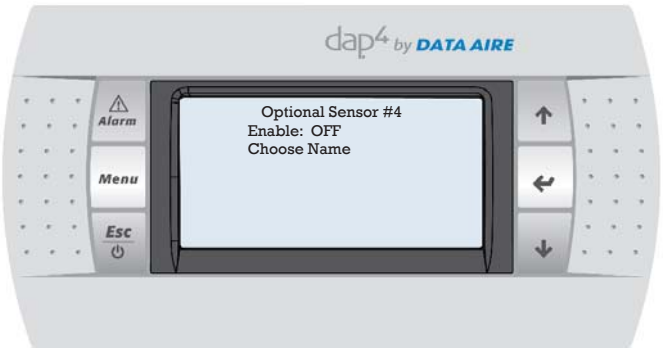
With Enable OFF
With Enable ON
The “Choose Name” allows one of the following to be selected by moving the cursor to the Choose Name and pressing the UP or DOWN key:

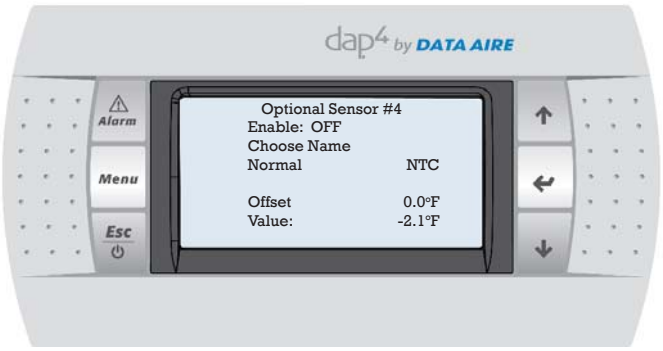
Diff Pressure	Suct Pressure	Disch Pressure	Outside Hum	Outside Temp	Zone Humidity
Zone Air Temp	CW Flow	Cond Wtr Flow	Ret Air Temp	Sply Air Temp	CW Ret Temp
CW Sply Temp	Cond Ret Temp	Cond Sup Temp	Power	Frequency	Ground Amps
Neutral Amps	Output Amps C	Output Amps B	Output Amps A	Input Amps C	Input Amps B
Input Amps A	Output V. B-C	Output V. A-C	Output V. A-B	Input V. B-C	Input V. A-C
Input V. A-B					

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



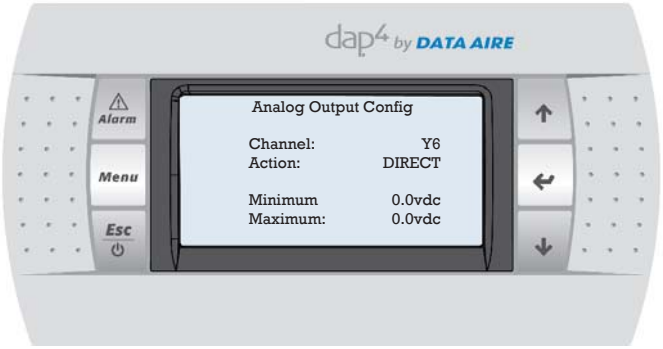


With Enable OFF
With Enable ON
The “Choose Name” allows one of the following to be selected by moving the cursor to the Choose Name and pressing the UP or DOWN key:

Diff Pressure	Suct Pressure	Disch Pressure	Outside Hum	Outside Temp	Zone Humidity
Zone Air Temp	CW Flow	Cond Wtr Flow	Ret Air Temp	Sply Air Temp	CW Ret Temp
CW Sply Temp	Cond Ret Temp	Cond Sup Temp	Power	Frequency	Ground Amps
Neutral Amps	Output Amps C	Output Amps B	Output Amps A	Input Amps C	Input Amps B
Input Amps A	Output V. B-C	Output V. A-C	Output V. A-B	Input V. B-C	Input V. A-C
Input V. A-B					

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:



The following will be displayed (values are for reference only):
Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

The following can be changed by pressing the DOWN key:

Channel – there are six (6) selections (Y1, Y 2, Y3, Y4, Y5 and Y6). There are five Analog outputs available. DO NOT ASSIGN THE SAME CHANNEL ON MORE THAN ONE ANA LOG OUTPUT.

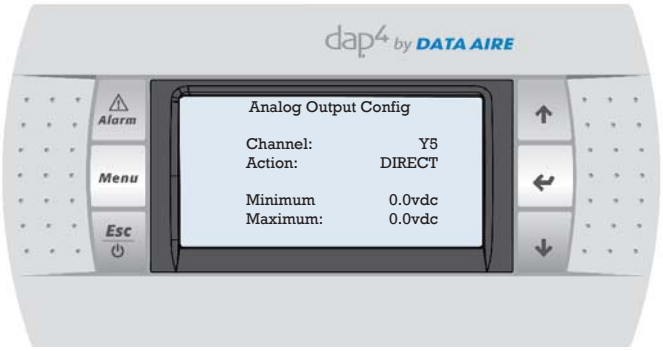
Action – there are two choices; DIRECT AND REVERSE

Minimum – the range is from 0.0vdc to 10.0vdc

Maximum – the range is from 0.0vdc to 10.0vdc

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:



The following will be displayed (values are for reference only):
Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

The following can be changed by pressing the DOWN key:

Channel – there are six (6) selections (Y1, Y 2, Y3, Y4, Y5 and Y6). There are five Analog outputs available. DO NOT ASSIGN THE SAME CHANNEL ON MORE THAN ONE ANA LOG OUTPUT.

Action – there are two choices; DIRECT AND REVERSE

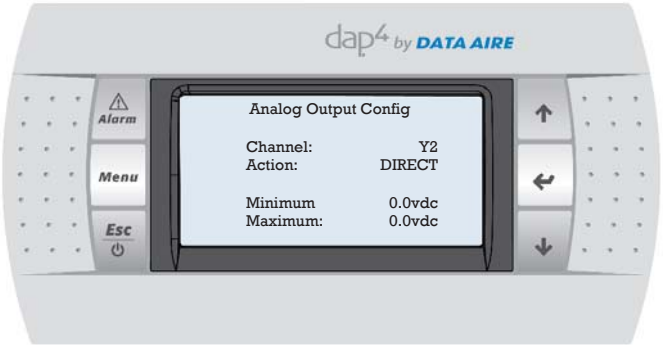
Minimum – the range is from 0.0vdc to 10.0vdc

Maximum – the range is from 0.0vdc to 10.0vdc

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:

The following will be displayed (values are for reference only):



Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

The following can be changed by pressing the DOWN key:

Channel – there are six (6) selections (Y1, Y 2, Y3, Y4, Y5 and Y6). There are five Analog outputs available. DO NOT ASSIGN THE SAME CHANNEL ON MORE THAN ONE ANALOG OUTPUT.

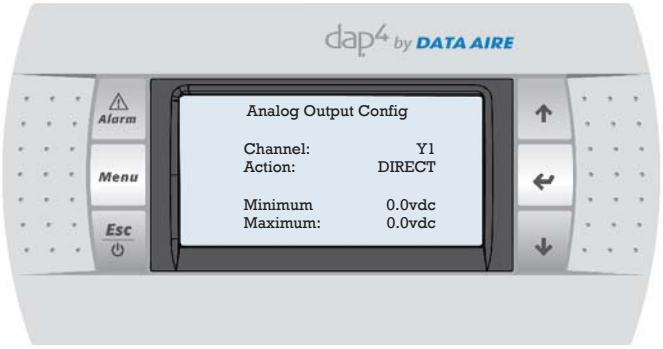
Action – there are two choices; DIRECT AND REVERSE

Minimum – the range is from 0.0vdc to 10.0vdc

Maximum – the range is from 0.0vdc to 10.0vdc

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:



The following will be displayed (values are for reference only):
Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

The following can be changed by pressing the DOWN key:

Channel – there are six (6) selections (Y1, Y 2, Y3, Y4, Y5 and Y6). There are five Analog outputs available. DO NOT ASSIGN THE SAME CHANNEL ON MORE THAN ONE ANALOG OUTPUT.

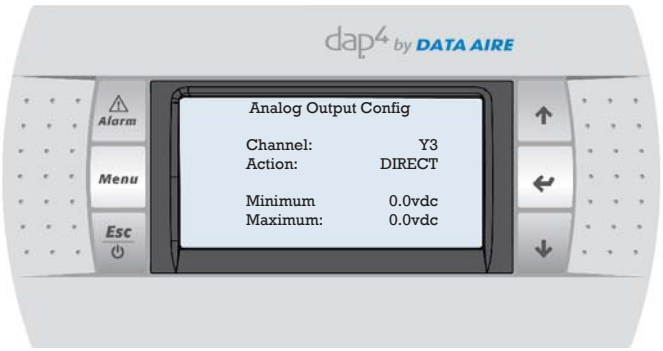
Action – there are two choices; DIRECT AND REVERSE

Minimum – the range is from 0.0vdc to 10.0vdc

Maximum – the range is from 0.0vdc to 10.0vdc

Once a selection or selections have been made, move the cursor to the title block by pressing the ENTER key

▼ Press the DOWN key to view the next screen:



The following will be displayed (values are for reference only):

Move the cursor by pressing the ENTER key. Move the cursor to change the setting.

The following can be changed by pressing the DOWN key:

Channel – there are six (6) selections (Y1, Y 2, Y3, Y4, Y5 and Y6). There are five Analog outputs available. DO NOT ASSIGN THE SAME CHANNEL ON MORE THAN ONE ANALOG OUTPUT.

Action – there are two choices; DIRECT AND REVERSE

Minimum – the range is from 0.0vdc to 10.0vdc

Maximum – the range is from 0.0vdc to 10.0vdc

To return to another Input or Output screen, with the cursor in the title block, press the UP or DOWN key to scroll through the selections

To Exit Menu L – Configure I/O, with the cursor in the title block, press the Menu key. The screen will display the Menus.

▼ Press the Esc key to return to the normal operating mode.

dap4 CONTROL LOGIC

SYSTEM START DELAY
After the self-test is complete, the Timed Start Delay will be displayed and will start counting down from the programmed delay time. The factory setting is five (5) seconds. The setting is programmed in Menu A – ON/OFF. The range is from 1 to 600 seconds in 5 second increments.

BLOWER
Plug Fans – Units with plug fans have a “soft-start”. Upon completion of the Timed Start Delay, on multiple fan units, the first fan will start. After five (5) seconds the second fan will start. The third and fourth fans (as applicable) will follow the same delay sequence.

Centrifugal Fans – The blower(s) will start upon completion of the Timed Start Delay and is programmed and wired to run continuously during unit operation.

FUNCTIONS
Cooling, reheat, humidification and dehumidification functions are inhibited for one (1) minute after the blower(s) start. This allows the temperature and humidity sensors to adjust.

COMPRESSOR COOLING
1. There is a five (5) minute delay between start-to-start of the same primary stage compressor. The delay will be increased to six (6) minutes for one (1) hour following the detection of a compressor short-cycle condition even if the compressor short cycle alarm is disabled (Menu K - Alarms and Limits).

2. There is a two (2) minute delay between stop-to-start of the same primary stage compressor.

3. There is a one (1) minute delay between stop-to-start of the same secondary unloader stage compressor or stop-to-start of a second secondary unloader stage compressor.

4. Compressor staging sequence at each adjustment period:

UNITS WITH STANDARD (DUAL) SCROLL COMPRESSORS

Compressor “ON” sequence (Increasing Temperature)

Cool 1 ON at Temperature Setpoint + Temperature Deadband
Cool 2 ON at Temperature Setpoint + Temperature Deadband + y°F

Compressor “OFF” sequence (Decreasing Temperature)

Cool 2 OFF at Temperature Setpoint + y°F
Cool 1 OFF at Temperature Setpoint

UNITS WITH OPTIONAL TANDEM SCROLL OR SEMI-HERMETIC COMPRESSORS

Compressor “ON” sequence (Increasing Temperature)
Cool 1 ON at Temperature Setpoint + Temperature Deadband
Cool 2 ON at Temperature Setpoint + Temperature Deadband + y°F
Cool 3 ON at Temperature Setpoint + Temperature Deadband + 2y°F
Cool 4 ON at Temperature Setpoint + Temperature Deadband + 3y°F

Compressor “OFF” sequence (Decreasing Temperature)

Cool 4 OFF at Temperature Setpoint + 3y°F
Cool 3 OFF at Temperature Setpoint + 2y°F
Cool 2 OFF at Temperature Setpoint + y°F
Cool 1 OFF at Temperature Setpoint

Note: y = “stage to stage” which can be changed in MenuB-Setpoints; default value is 0.3

5. If the temperature drops below the setpoint during an adjustment period, all compressors turn OFF at once.

CHILLED WATER COOLING

Chilled water valve “opening” sequence (Increasing Temperature)

1. The chilled water valve proportionally opens 10% for each 0.1°F above the temperature setpoint plus temperature deadband.

2. The chilled water valve responds to a change of the return air temperature after each adjustment period. When a change is made to the setpoint, the chilled water valve will delay its response for five (5) minutes, after which it will respond to each adjustment period.

If the current temperature is higher than the temperature at the last adjustment period, the following sequence will determine the new valve position:

Current Temperature = Setpoint + Deadband + 0.0°F = 0% Position Open
Current Temperature = Setpoint + Deadband + 0.1°F = 10% Position Open
Current Temperature = Setpoint + Deadband + 0.2°F = 20% Position Open
Current Temperature = Setpoint + Deadband + 0.3°F = 30% Position Open
Current Temperature = Setpoint + Deadband + 0.4°F = 40% Position Open
Current Temperature = Setpoint + Deadband + 0.5°F = 50% Position Open
Current Temperature = Setpoint + Deadband + 0.6°F = 60% Position Open
Current Temperature = Setpoint + Deadband + 0.7°F = 70% Position Open
Current Temperature = Setpoint + Deadband + 0.8°F = 80% Position Open
Current Temperature = Setpoint + Deadband + 0.9°F = 90% Position Open
Current Temperature = Setpoint + Deadband + 1.0°F = 100% Position Open

Chilled water valve “closing” sequence (Decreasing Temperature)

1. The chilled water valve proportionally closes 10% for each 0.1°F below the temperature setpoint plus 1.0°F.

2. The chilled water valve responds to a change of the return air temperature after each adjustment period. When a change is made to the setpoint, the chilled water valve will delay its response for five (5) minutes, after which it will respond to each adjustment period.

3. If the current temperature is lower than the temperature at the last adjustment period, the following sequence will determine the new valve position:

Current Temperature = Setpoint + 1.0°F = 100% Position Open
Current Temperature = Setpoint + 0.9°F = 90% Position Open
Current Temperature = Setpoint + 0.8°F = 80% Position Open
Current Temperature = Setpoint + 0.7°F = 70% Position Open
Current Temperature = Setpoint + 0.6°F = 60% Position Open
Current Temperature = Setpoint + 0.5°F = 50% Position Open
Current Temperature = Setpoint + 0.4°F = 40% Position Open
Current Temperature = Setpoint + 0.3°F = 30% Position Open
Current Temperature = Setpoint + 0.2°F = 20% Position Open
Current Temperature = Setpoint + 0.1°F = 10% Position Open
Current Temperature = Setpoint + 0.0°F = 0% Position Open

4. If the temperature is consistently rising, the valve will open accordingly at each adjustment period. Likewise, if the temperature is consistently falling, the valve will close accordingly at each adjustment period. However, if the temperature changes directions, the temperature must change the amount of the deadband before the valve will be repositioned. The temperature can slowly drift back and forth within a deadband window at any point in the adjustment period without a valve position change.

ENERGY SAVER and AUXILIARY CHILLED WATER COOLING

1. Energy Saver/Auxiliary Chilled Water Cooling will be available whenever the incoming water (or water/glycol) supply is below the Energy Saver/Chilled Water temperature setpoint (Menu B – Setpoint).

2. The Energy Saver/Auxiliary Chilled Water Cooling mode will operate only in a two (2) degree range. The range is between the return air setpoint plus deadband and two (2) degrees. If the temperature rises above this range, the

Energy Saver/Auxiliary Chilled Water Cooling will be inhibited for the amount of time set in Menu J, “Energy Saver Lockout Time” and DX (Direct Expansion) cooling will take over. After the amount of time set in Menu J – Factory Settings, “Energy Saver Lockout Time”, it will try Energy Saver/Auxiliary Chilled Water Cooling again.

3. The chilled water valve proportionally opens 10% for each 0.1°F above the temperature setpoint plus temperature deadband.

4. The chilled water valve responds to a change of the return air temperature after each adjustment period. When a change is made to the setpoint, the chilled water valve will delay its response for five (5) minutes, after which it will respond to each adjustment period.

5. If the temperature is consistently rising, the valve will be opened more at each adjustment period. Likewise, if the temperature is consistently falling, the valve will be closed more at each adjustment period. However, if the temperature movement changes directions, then it must change the amount of the deadband before the valve will be repositioned. The temperature can be slowly drifting back and forth within a deadband window at any point in the adjustment period and no valve changes will be made.

6. If the current temperature is higher than at the last adjustment period, the following sequence is used to determine the new valve position:

Current Temperature = Setpoint + Deadband + 0.0°F = 0% Position Open
Current Temperature = Setpoint + Deadband + 0.1°F = 10% Position Open
Current Temperature = Setpoint + Deadband + 0.2°F = 20% Position Open
Current Temperature = Setpoint + Deadband + 0.3°F = 30% Position Open
Current Temperature = Setpoint + Deadband + 0.4°F = 40% Position Open
Current Temperature = Setpoint + Deadband + 0.5°F = 50% Position Open
Current Temperature = Setpoint + Deadband + 0.6°F = 60% Position Open
Current Temperature = Setpoint + Deadband + 0.7°F = 70% Position Open
Current Temperature = Setpoint + Deadband + 0.8°F = 80% Position Open
Current Temperature = Setpoint + Deadband + 0.9°F = 90% Position Open
Current Temperature = Setpoint + Deadband + 1.0°F = 100% Position Open

7. The chilled water valve proportionally closes 10% for each 0.1°F below the temperature setpoint plus 1°F.

8. If the current temperature is lower than at the last adjustment period, the following sequence is used to determine the new valve position:

Current Temperature = Setpoint + 1.0°F = 100% Position Open
Current Temperature = Setpoint + 0.9°F = 90% Position Open
Current Temperature = Setpoint + 0.8°F = 80% Position Open
Current Temperature = Setpoint + 0.7°F = 70% Position Open
Current Temperature = Setpoint + 0.6°F = 60% Position Open
Current Temperature = Setpoint + 0.5°F = 50% Position Open
Current Temperature = Setpoint + 0.4°F = 40% Position Open
Current Temperature = Setpoint + 0.3°F = 30% Position Open
Current Temperature = Setpoint + 0.2°F = 20% Position Open
Current Temperature = Setpoint + 0.1°F = 10% Position Open
Current Temperature = Setpoint + 0.0°F = 0% Position Open

9. The dap4 will switch the unit to DX cooling for one (1) hour after every 100 hours of continuous hours of Energy Saver or Auxiliary Chilled Water Cooling.

ENERGY SAVER and AUXILIARY CHILLED WATER COOLING ASSIST

1. Energy Saver/Auxiliary Chilled Water Cooling can operate simultaneously with compressor cooling. An optional discharge temperature sensor is required.

2. The Energy Saver/Auxiliary Chilled Water Cooling will be the same and the compressor rules for short-cycle time will not be violated.

3. The following is the compressor staging sequence at each adjustment period.

UNITS WITH STANDARD (DUAL) SCROLL COMPRESSORS

Cool 1 ON at Temperature Setpoint + Temperature Deadband + 1.3°F and Valve 100% Open
Cool 2 ON at Temperature Setpoint + Temperature Deadband + 1.6°F and Valve 100% Open
Cool 2 OFF at Temperature Setpoint + 1.6°F and Valve 100% Open
Cool 2 OFF at Temperature Setpoint + 1.3°F and Valve 100% Open until next adjustment period

UNITS WITH OPTIONAL TANDEM SCROLL or SEMI-HERMETIC (W/UNLOADING) COMPRESSORS

Cool 1 ON at Temperature Setpoint + Temperature Deadband + 1.3°F and Valve 100% Open
Cool 2 ON at Temperature Setpoint + Temperature Deadband + 1.6°F and Valve 100% Open
Cool 3 ON at Temperature Setpoint + Temperature Deadband + 1.9°F and Valve 100% Open
Cool 4 ON at Temperature Setpoint + Temperature Deadband + 2.2°F and Valve 100% Open
Cool 4 OFF at Temperature Setpoint + 2.2°F and Valve 100% Open
Cool 3 OFF at Temperature Setpoint + 1.9°F and Valve 100% Open
Cool 2 OFF at Temperature Setpoint + 1.6°F and Valve 100% Open
Cool 1 OFF at Temperature Setpoint + 1.3°F and Valve 100% Open until next adjustment period

REHEAT

1. There is a one (1) minute delay between the stop of any reheat stage to the start of any reheat stage.

2. There is a one (1) minute delay from the start-to-start of different reheat stages. Reheat stages rotate every 100 hours of runtime.

3. The reheat staging at each adjustment period is as follows:

Reheat 1 ON at Temperature Setpoint – Temperature Deadband
Reheat 2 ON at Temperature Setpoint – Temperature Deadband – y°F
Reheat 3 ON at Temperature Setpoint – Temperature Deadband – 2y°F
Reheat 3 OFF at Temperature Setpoint – 2y°F
Reheat 2 OFF at Temperature Setpoint – y°F
Reheat 1 OFF at Temperature Setpoint

Note: y = “stage to stage” which can be changed in MenuB-Setpoints; default value is 0.3

4. The above reheat staging is for the standard 3 stage electric reheat. Other types of reheat are available (hot water and hot gas). They are single stage. Single stage operates in the following manner:

Reheat is ON at Temperature Setpoint – Temperature Deadband
Reheat is OFF at Temperature Setpoint

5. Reheat will be overridden by humidification when the humidifier setting is programmed for Computer, Non-Modulating or Computer, Modulating (See Menu J – Factory Settings).

HUMIDIFICATION

1. Humidification will inhibit the reheat if programmed (See Menu J Factory Settings) for Humidifier: Computer Non-Modulating or Humidifier: Computer Modulating. Reheat is allowed during humidification if programmed for Humidifier Comfort, Non-Modulating or Humidifier Comfort, Modulating.

2. There is a one (1) minute delay between the stop-to-start of humidification.

3. There is a five (5) minute delay between the dehumidification and start of humidification.

4. The humidification staging sequence of each adjustment period for ON/OFF of non-modulating humidifiers is as follows:

Humidifier is ON at Humidity Setpoint – Humidity Deadband
Humidifier is OFF at Humidity Setpoint – 1.0%

5. The humidification staging sequence for a modulating humidifier is as follows:

Valve is OPENED at Humidity Setpoint – 1.0%
Valve is CLOSED at Humidity Setpoint – 0.5%

6. When the humidifier valve is opened, its position will follow a linear ramp that goes from 25% open with the humidity at setpoint minus 0.5% to 100% open at setpoint minus humidity deadband.

DEHUMIDIFICATION

1. Dehumidification Mode can be programmed with one or two compressors for dehumidification and with or without reheat limits (See Menu J – Factory Settings).

2. If dehumidification is programmed for “Within Reheat Limits” dehumidification will inhibit reheat if the return air temperature drops to temperature setpoint minus temperature deadband minus 0.9°F. Dehumidification will be inhibited until the return air temperature rises to the temperature setpoint. Compressor short-cycle time will not be violated.

3. If dehumidification is programmed for “No Reheat Limits” it will remain ON until the humidity setpoint is reached. In this mode dehumidification has priority and overcooling is disregarded. The reheat sequence will remain the same.

4. If dehumidification is programmed for two (2) compressors, with or without reheat limits, only one (1) compressor will be allowed if reheat is required.

5. There is a one (1) minute delay between stop-to-start of dehumidification. Compressor short-cycle time delay will not be violated.

6. There is a five (5) minute delay between dehumidification and humidification.

7. The compressor staging sequence for dehumidification at each adjustment period is as follows:

UNITS WITH STANDARD (DUAL) SCROLL COMPRESSORS

Cool 1 ON at Humidity Setpoint + Humidity Deadband
Cool 2 ON at Humidity Setpoint + Humidity Deadband + 1%
Cool 2 OFF at Humidity Setpoint + 1%
Cool 1 OFF at Humidity Setpoint

UNITS WITH OPTIONAL TANDEM SCROLL or SEMI-HERMETIC (W/UNLOADING) COMPRESSORS

Cool 1 ON at Humidity Setpoint + Humidity Deadband
Cool 2 ON at Humidity Setpoint + Humidity Deadband + 1%
Cool 3 ON at Humidity Setpoint + Humidity Deadband + 2%
Cool 4 ON at Humidity Setpoint + Humidity Deadband + 3%
Cool 4 OFF at Humidity Setpoint + 3%
Cool 3 OFF at Humidity Setpoint + 2%
Cool 2 OFF at Humidity Setpoint + 1%
Cool 1 OFF at Humidity Setpoint

8. The sequence for dehumidification with Energy Saver or Auxiliary Chilled Water Cooling is as follows:

Valve is OPENED to 100% at Humidity Setpoint + Humidity Deadband
Valve is CLOSED at Humidity Setpoint

DEHUMIDIFICATION FOR CHILLED WATER UNITS

1. All the standard dehumidification rules for dehumidification with compressors applies to chilled water units.

2. The chilled water valve responds to a change of the return air relative humidity (RH) after each adjustment period. When a change is made to the setpoint, the chilled water valve will delay its response for five (5) minutes after which it will respond after each adjustment period.

3. The dehumidification sequence for chilled water units is as follows:

Valve is OPENED to 100% at Humidity Setpoint + Humidity Deadband
Valve is CLOSED at Humidity Setpoint

AUTOMATIC FLUSH CYCLE for CHILLED WATER or HOT WATER COILS

If 100 hours elapses and the chilled water or hot water valve has not opened for normal cooling or heating, the valve will automatically open for 30 seconds to flush the coil. The display module will not display a message indicating the flush cycle is in progress.

HUMIDIFIER AUTO-FLUSH TIMER CONTROL

1. Humidifier auto-flush timer is optional. The auto-flush timer is only available on units with infrared humidifiers.

2. The auto-flush timer is programmable (See Menu J – Factory Settings).

3. The auto-flush cycle takes 11 minutes. The sequence is as follows:

    - For the first four minutes the drain solenoid is opened and humidification is inhibited (the display module will have the following message: Humidification Inhibited by Auto-Flush). Humidity related alarms are disabled.
    - During the fifth and sixth minutes the solenoid is closed and the drain starts to fill
    - From minutes seven through eleven the humidification is enabled and the pan continues to fill. The Humidification Inhibited message is discontinued.
    - After eleven minutes the humidity alarms are enabled

HUMIDITY ANTICIPATION

1. Humidity anticipation is programmable: ON or OFF (See Menu J – Factory Settings)

2. When set to ON, the humidity setpoint is automatically modified to reduce excessive humidifying and dehumidifying.

    - The humidity setpoint is decreased by 1% for 1.5°F the return air temperature rises above the temperature setpoint. The maximum amount the humidity setpoint may be decreased is 10% (15°F above the return air temperature setpoint).
    - The humidity setpoint is increased by 1% for every 1.5°F the return air temperature falls below the temperature setpoint. The maximum amount the humidity setpoints may be increased is 10% (15°F below the return air temperature setpoint).

MANUAL OVERRIDE

When the manual override function is used, the automatic functions of the processor are disabled and all desired functions must be changed to manual override. The display module will indicate Manual Override.

TEMPERATURE and HUMIDITY SENSOR PROBLEM

1. A temperature sensor problem will activate all of the cooling stages if the unit is operating at the time of the problem.

2. A humidity sensor problem will inhibit the humidification or dehumidification functions if the unit is operating at the time of the problem.

COMPRESSOR SHORT-CYCLE ALARM

1. Compressor shot-cycle alarm is programmable (see Menu K – Alarms and Limits). A compressor short-cycle alarm will activate if the compressor has been energized ten (10) times in a one (1) hour period.

2. The alarm is a warning only. Compressor operation will continue.

3. One cycle is a combination of compressor starts for cooling or dehumidification functions.

4. If the compressor is started ten (10) times in a one (1) hours period, the alarm will be activated and the message “Comp Short- Cycle” will be displayed on the display module.

5. The compressor short-cycle time delay will be increased from five (5) to six (6) minutes for the next hour.

6. The short-cycle alarm will not clear until a one (1) hour period has passed with less than ten (10) compressor starts.

POWER PROBLEM or RESTART MODE

The Power Problem or Restart Mode is programmable (See Menu K – Alarms and Limits). There are three available selections:

1. "Auto, No Alarm" (Automatic: No Message or Alarm). The unit will automatically start after a power failure or reset. No audio alarm will sound. No message will be displayed on the display module.

2. "Auto, With Alrm" (Automatic: Message, Audio Alarm & Relay). The unit will automatically restart after a power failure or reset. The audio alarm will be activated and the message " Power Failure Restart" will be displayed on the display module.

3. "Man, Clr Alarm" (Manual: Message, Audio Alarm & Relay). The unit will NOT automatically restart after a power failure or restart.

NO AIRFLOW ALARM

1. When no airflow is detected via the air flow switch or current sensing relay, the cooling, reheat, humidification and dehumidification functions are locked out until the alarm condition is corrected. Menu K – Alarms and Limits, allows adjustment of the alarm delay from 5 to 180 seconds in 5 second increments. Adjustment is to minimize false alarms due to air turbulence.

2. The audio alarm is activated and a "No Air Flow" message is displayed on the display module until the condition is corrected.

DIRTY FILTER ALARM

When a dirty filter is detected (through the unit mounted pressure differential switch), the audio alarm is activated and a "Dirty Filter" message will be displayed on the display module until the condition is corrected.

FIRESTAT TEMPERATURE ALARM

1. The firestat temperature alarm is programmable from 100 to 150°F (See Menu K – Alarms and Limits).

2. If the return air temperature reaches the firestat temperature alarm limit, the blower, cooling, reheat, humidification and dehumidification functions are immediately terminated.

3. The audio alarm is activated and "Firestat Tripped – Unit Shutdown" message will be displayed on the display module until the condition is corrected.

4. The alarm will prevent the unit from operating until the alarm is corrected.

HIGH TEMPERATURE ALARM LIMIT

1. The high temperature alarm limit is programmable (See Menu K – Alarms and Limits). The range is from 70 to 90°F. It can also be disabled.

2. If the alarm is not disabled and the return air temperature rises above the high temperature alarm limit, the audio alarm is activated and a "High Return Air Temperature" message is displayed on the display module.

3. The audio alarm is a warning only and will not prevent any of the unit functions form operating.

4. The alarm will remain until the alarm condition is corrected.

LOW TEMPERATURE ALARM LIMIT

1. The low temperature alarm limit is programmable (See Menu K – Alarms and Limits). The range is from 55 to 75°F. It can also be disabled.

2. If the alarm is not disabled and the return air temperature rises above the high temperature alarm limit, the audio alarm is activated and a "Low Return Air Temperature" message is displayed on the display module.

3. The audio alarm is a warning only and will not prevent any of the unit functions form operating.

4. The alarm will remain until the alarm condition is corrected.

HIGH HUMIDITY ALARM LIMIT

1. The high humidity alarm limit is programmable (See Menu K – Alarms and Limits). The range is from 35 to 90%. It can also be disabled.

2. If the alarm is not disabled and the return air temperature rises above the high temperature alarm limit, the audio alarm is activated and a “High Humidity Warning” message is displayed on the display module.

3. The audio alarm is a warning only and will not prevent any of the unit functions form operating.

4. The alarm will remain until the alarm condition is corrected.

LOW HUMIDITY ALARM LIMIT

1. The high humidity alarm limit is programmable (See Menu K – Alarms and Limits). The range is from 10 to 65%. It can also be disabled.

2. If the alarm is not disabled and the return air temperature rises above the high temperature alarm limit, the audio alarm is activated and a “Low Humidity Warning” message is displayed on the display module.

3. The audio alarm is a warning only and will not prevent any of the unit functions form operating.

4. The alarm will remain until the alarm condition is corrected.

LOW DISCHARGE TEMPERATURE ALARM LIMIT

1. An optional discharge sensor is required. The low discharge temperature alarm limit is programmable (See Menu K – Alarms and Limits). The range is from 45 to 60°F. It can also be disabled.

2. If the alarm is not disabled and when the discharge air temperature falls to the low discharge alarm limit, the audio alarm is activated and a “Low Discharge Air Temperature” message will be displayed on the display module.

3. If the optional Energy Saver with Compressor Assist is used (See Menu J – Factory Settings), the compressor(s) will be inhibited for 15 minutes.

4. The alarm will remain until the alarm condition is corrected.

SCHEDULED NORMAL MAINTENANCE ALARM

1. The scheduled normal maintenance alarm is programmable (See Menu K – Alarms and Limits). The programmable range is 1 to 100 hours. It may also be disabled.

2. The alarm is a warning only and will not prevent any of the unit functions from operating.

3. The alarm will remain until the alarm condition is corrected.

HIGH PRESSURE/INTERNAL OVERLOAD COMPRESSOR ALARM

1. In the event of a high pressure condition, the high head pressure switch is tripped or the compressor(s) overload contact opens, the audio alarm is activated and a “Circuit #1: High Pressure” or “Circuit #2: High Pressure” message will be displayed on the display module.

2. The alarm will prevent the compressor(s) from operating and must be MANUALLY RESET.

3. The alarm will remain until the alarm condition is corrected.

LOW PRESSURE COMPRESSOR ALARM

1. In the event of a low pressure condition, the audio alarm is activated and a “Circuit #1: Low Pressure” or “Circuit #2: Low Pressure” message will be displayed on the display module.

2. The alarm will prevent the compressor(s) from operating but will automatically reset when the head pressure condition is corrected.

3. The alarm will remain until the alarm condition is corrected.

PERSON TO CONTACT ON ALARM

1. The person to contact on alarm is programmable (See Menu K – Alarms and Limits). It can also be disabled.

2. The alarm is a warning only and will not prevent any of the unit functions from operating.

3. The alarm will remain until the alarm condition is cleared.

SMOKE ALARM

1. The smoke alarm requires an optional smoke detector.

2. If the smoke detector senses smoke, the blower, the cooling, the reheat, the humidification and dehumidification are immediately terminated.

3. The audio alarm is activated and a “Smoke Detector” message is displayed on the display module.

4. The alarm will prevent the unit from operating until the alarm condition is corrected.

HIGH CONDENSATE WATER LEVEL ALARM

1. The high condensate water level alarm requires an optional condensate pump and secondary float switch.

2. When the high condensate water level alarm is activated, the blower, the cooling, the reheat, the humidification and dehumidification are inhibited.

3. The audio alarm is activated and a “High Condensate Water Level” message is displayed on the display module.

4. The alarm will prevent the unit from operating until the alarm condition is corrected (condensate pump is checked and its float switch is open).

FAN MOTOR OVERLOAD ALARM

1. The fan motor overload is optional and requires a motor overload relay contact for each motor.

2. The alarm is programmable (See Menu …….)

3. The audio is activated and a “Blower Overload” message is displayed on the display module.

4. The alarm is a warning only and will not prevent any of the unit functions from operating.

5. The alarm will remain until the alarm condition is corrected.

NO WATER FLOW ALARM ACTION

1. The no water flow alarm is optional and requires a field provided and installed flow switch.

2. The no water flow alarm action is programmable (See Menu K – Alarms and Limits).

3. The audio alarm is activated and a “No Water Flow – Check Pump” message will be displayed on the display module.

4. The alarm can be set as a warning and will not prevent any of the unit functions from operating or it can be set to lockout the compressor(s). All other functions continue and manual reset is required.

5. The alarm will remain until the alarm condition is corrected.

NO WATER FLOW ALARM ACTION – CHILLED WATER UNITS

1. The dap4 controller will not detect the no water flow alarm unless the chilled water valve position is at least 60% open.
2. If the valve opens 60% or more, the no water flow alarm detection will be displayed for the amount of delay set in Menu K (Alarms and Limits). The programmable range is from 5 to 180 seconds in 1 second increments.

3. A “No Water Flow – Check Pump” message will be displayed on the display module and the alarm contacts will close when a no water flow alarm is detected.

NO WATER FLOW ALARM ACTION – DX COOLING UNITS

1. The dap4 controller will only detect the no water flow alarm when the unit calls for cooling.

2. Each time the cooling stage starts, the no water flow alarm detection will be displayed for the amount of time that is set in Menu K (Alarms and Limits). The programmable range is from 5 to 180 seconds in 1 second increments. The factory setting is 5 seconds

3. If the “Action” is set (See Menu K – Alarms and Limits) to “Compressor Lockout”, when a no water flow alarm is detected, the compressor(s) will be inhibited for 5 minutes and a “No Water Flow Check Pump: Compressor Lockout” message will be displayed on the display module.

STANDBY PUMP ON ALARM

1. The standby pump on alarm is optional and requires a contact from the optional Pump Auto-Changeover control to be added to the remote dry cooler.

2. The alarm is programmable (See Menu K – Alarms and Limits).

3. The audio alarm is activated and a “STANDBY PUMB ON” message will be displayed on the display module.

4. The alarm is a warning only and will not prevent any of the unit functions from operating.

5. The alarm will remain until the alarm condition is corrected.

UPS/ALTERNATE POWER ON ALARM

1. The UPS/alternate power on alarm is optional and requires an input contact from a field supplied alternate power source or contacts.

2. The alarm is programmable (See Menu K – Alarms and Limits).

3. The audio alarm is activated and a “UPS/Alternate Power On:Check Main Power” message will be displayed on the display module.

4. The alarm is a warning only and will not prevent any of the unit functions from operating.

5. The alarm will remain until the alarm condition is corrected.

REHEAT INHIBITED ALARM

1. The reheat inhibited alarm is optional and requires an input contact from a field supplied alternate power source or contacts.

2. The alarm is programmable (See Menu K – Alarms and Limits).

3. The audio alarm is activated and a “Reheat Inhibited” message will be displayed on the display module.

4. If in operating mode, the reheat is shut off and locked (off) when alarm is present.

5. The alarm will remain until the alarm condition is corrected.

HUMIDIFICATION INHIBITED ALARM

1. The humidification inhibited alarm is optional and requires an input contact from a field supplied alternate power source or contacts.

2. The alarm is programmable (See Menu K – Alarms and Limits).

3. The audio alarm is activated and a “Humidification Inhibited” message will be displayed on the display module.

4. If in operating mode, the humidification is shut off and locked (off) when alarm is present.

5. The alarm will remain until the alarm condition is corrected.

REHEAT AND HUMIDIFICATION INHIBITED ALARM

1. The humidification inhibited alarm is optional and requires an input contact from a field supplied contact.

2. The alarm is programmable (See Menu K – Alarms and Limits).

3. The audio alarm is activated and a “Reheat and Humidification Inhibited” message will be displayed on the display module.

4. If in operating mode, the reheat and humidification is shut off and locked (off) when alarm is present.

5. The alarm will remain until the alarm condition is corrected.

CUSTOM MESSAGE ALARM

1. The custom message is optional and requires factory programming and is limited to twenty-one (21) characters including spaces.

2. The custom message alarm can be changed to preset messages or to a no contact message (See Menu K – Alarms and Limits).

3. The alarm is activated and the custom message is displayed on the display module.

4. The alarm will remain until the alarm condition is corrected.

WATER UNDER FLOOR DETECTION ALARM

1. The water under floor detection alarm message is displayed when the alarm is activated (the sensor has detected water).

2. The alarm is programmable (See Menu K – Alarms and Limits). There are three (3) settings: Alarm Only, Shutdown Unit and Lockout Comps. The unit will respond to the setting.

3. Unit will return to normal operation when the alarm is corrected.

FAN SPEED CONTROL FOR CHILLED WATER (CW) UNITS WITH PLUG FANS

Seven (7) fan speed control modes can be selected for units with plug fans. The control modes are programmable (See Menu J – Factory Settings: Fan Settings). Any one of the following may be chosen:

1. Const Speed (Constant fan speed)
2. BMS Speed (Fan speed controlled by BMS)
3. Vlv Pos Speed (Proportional fan speed control based on the CW valve action)
4. Air Pressure (Constant air static pressure)

1. Const Speed (Constant fan speed): On units where constant design fan speed is required (i.e. standard plug fan configuration), a value based on percentage of fan speed is entered into the dap4 through Menu J – Factory Settings (Const Speed). The adjustable range is 60 – 100%, which results in an analog output of 6 VDC to 10 VDC. In this mode the fan will start and operate at the selected fan speed.

2. BMS Speed (Fan speed controlled by BMS mode) – Allow users to control the fan speed by BMS. The range for this fan speed is from 30-100%. In this mode, “CW Speed” and the “Modulating Max” and “Modulating Min” must be configured.

When the fan starts, it will operate at the front panel programmed constant fan speed (“CW Speed” is selectable between 60-100%). It will modulate to the BMS programmed fan speed when a network communication (with the BMS) is established.

If either the reheat or humidifiers are used, the maximum fan speed setting is required and will be used as the maximum limit fan speed. If the reheat or humidifier is required while the fan speed is commanded by the BMS to a value that is lower than the maximum fan speed, the fan speed will automatically increase to the maximum speed. The fan speed will revert to the BMS programmed fan speed when the unit stops calling for reheat or humidifier.
WARNING: IF THE CUSTOMER DECIDES TO USE THIS FAN SPEED CONTROL MODE (FAN SPEED CONTROLLED BY BMS MODE), DATA AIRE WILL NOT BE RESPONSIBLE FOR ANY EFFECTS, MALFUNCTIONS OR

SPACE CONTROL CONDITIONS CAUSED BY THIS SELECTION.

3. Vlv Pos Flow (Proportional fan speed control based on the CW action mode) – Allow users to automatically control the fan speed based on the CW valve action. In this mode, “CW Speed” and the “Modulating Max” and “Modulating Min” must be configured. “Modulate Max” is the maximum allowable fan speed (range 70 – 100% of fan capability). “Modulate Min” is a minimum fan speed (as low as 40% of the maximum allowable fan speed).
Example: For a fan with a speed capacity of 1750 RPM, a maximum allowable programmed fan speed of 1501 RPM is chosen. At this RPM, the maximum speed is 86% of the rated RPM (1501/1750 = 85.77%). If 60% is chosen for minimum fan speed menu J (Factory settings), the minimum programmed fan speed will be 901 RPM (1501 x .60 = 901) and the fan capability is 52% (901/1750 = 51.49%).
When the fan starts, it will operate at the minimum fan speed. As the chilled water valve opens, the fan speed will modulate proportionally based on the chilled water valve action from the programmed maximum fan speed (when the chilled water valve is fully open).
The fan will operate at the maximum fan speed when the unit calls for reheat or humidification.

4. Air Pressure (Constant static pressure control mode): In this mode, the controller will automatically adjust the fans’ speed in order to achieve a desired differential pressure. A differential pressure transmitter is required to installed and configured (Menu L: Configure I/O). When this option is selected, a separate page called Static Fan Pressure will show up. Users need to enter the “CW Speed”, “Modulate Max”, “Modulate Min” on the Fan Settings page and configure the “Setpoint”, “Band” and “Int time” on the Static Fan Pressure page (Menu J: Factory Settings)
When started in this mode, the fan will first operate at the programmed constant fan speed for 5 minutes. After the initial 5 minutes, the fan will proportionally increase or decrease the speed to maintain a constant static pressure setpoint as follows:

- If the measured differential pressure is less than the differential pressure setpoint 1% for each response time period (“Int time”) until the differential pressure setpoint is reached (fan speed cannot exceed the maximum speed).

- If the measured differential pressure is greater than the differential pressure setpoint plus differential pressure band, the fan speed will decrease 1% for each response time period until the differential pressure setpoint is reached (fan speed cannot be lower than minimum fan speed).

- Otherwise, fan speed will remain constant

FAN SPEED CONTROL FOR DIRECT EXPANSION (DX) UNITS
Two (3) fan speed control modes can be selected for units with plug fans. The control modes are accessible through Menu J – Factory Settings. Either of the following may be chosen:

1. Const Speed (Constant fan speed)
2. BMS Speed (Fan speed controlled by BMS)
3. Air Pressure (Constant air static pressure)

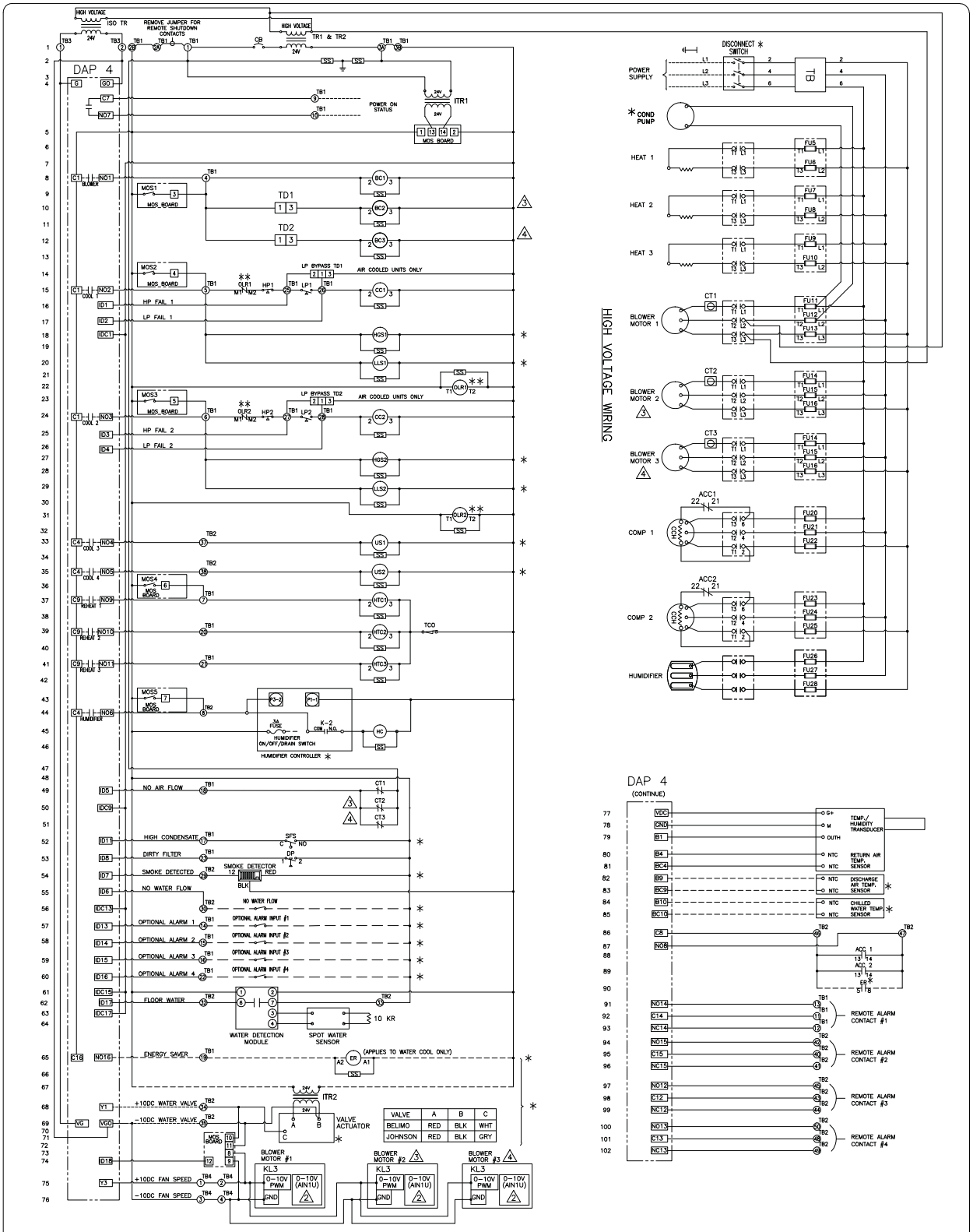
1. Const Speed (Constant fan speed): On units where constant design fan speed is required (i.e. standard plug fan configuration), a value based on percentage of fan speed is entered into the dap4 through Menu J – Factory Settings (Const Speed). The adjustable range is 70 – 100%, which results in an analog output of 7 VDC to 10 VDC. In this mode the fan will start and operate at the selected fan speed.

2. BMS Speed (Fan speed controlled by BMS mode) – Similar to BMS Speed fan speed control for Chilled Water units.

3. Air Pressure (Constant air static pressure speed control) - In this mode, the controller will automatically adjust the fans’ speed in order to achieve a desired differential pressure. A differential pressure transmitter is required to installed and configured (Menu L: Configure I/O). When this option is selected, a separate page called Static Fan Pressure will show up. Users need to enter the “DX Speed” (constant speed), “Modulate Max”, “Modulate Min” on the Fan Settings page and configure the “Setpoint”, “Band” and “Int time” on the Static Fan Pressure page (Menu J: Factory Settings)
The fan speed control logic is similar to that of fan speed control by Air Pressure for Chilled Water units. However, an optional discharge sensor is required for this mode. The discharge sensor will be used as a safety freeze thermostat. If the discharge temperature falls below the discharge temperature limit setting, the fan will increase to the maximum allowable programmed speed until the discharge temperature rises above the discharge temperature limit for 15 minutes.

TEMPERATURE SENSOR CHART

Temperature		Resistance Value	Temperature		Resistance Value	Temperature		Resistance Value
°F	°C	KΩ	°F	°C	KΩ	°F	°C	KΩ
-58.0	-50.0	329.20	33.8	1.0	26.13	132.8	56.0	3.42
-56.2	-49.0	310.70	35.6	2.0	25.03	134.6	57.0	3.31
-54.4	-48.0	293.30	37.4	3.0	23.99	136.4	58.0	3.21
-52.6	-47.0	277.00	39.2	4.0	22.99	138.2	59.0	3.11
-50.8	-46.0	261.80	41.0	5.0	22.05	140.0	60.0	3.02
-49.0	-45.0	247.50	42.8	6.0	21.15	141.8	61.0	2.92
-47.2	-44.0	234.10	44.6	7.0	20.29	143.60	62.0	2.83
-45.4	-43.0	221.60	46.4	8.0	19.40	145.4	63.0	2.75
-43.6	-42.0	209.80	48.2	9.0	18.70	147.20	64.0	2.66
-41.8	-41.0	198.70	50.0	10.0	17.96	149.0	65.0	2.58
-40.0	-40.0	188.40	51.8	11.0	17.24	150.8	66.0	2.51
-38.2	-39.0	178.30	53.6	12.0	16.55	152.6	67.0	2.43
-36.4	-38.0	168.90	55.4	13.0	15.90	154.4	68.0	2.36
-34.6	-37.0	160.10	57.2	14.0	15.28	256.2	69.0	2.29
-32.8	-38.0	151.80	59.0	15.0	14.68	158.0	70.0	2.22
-31.0	-39.0	144.00	60.8	16.0	14.12	159.8	71.0	2.16
-29.2	-34.0	136.60	62.6	17.0	13.57	161.6	72.0	2.10
-27.4	-33.0	129.70	64.4	18.0	13.06	163.4	73.0	2.04
-25.6	-32.0	123.20	66.2	19.0	12.56	165.20	74.0	1.98
-23.8	-31.0	117.10	68.0	20.0	12.09	167.0	75.0	1.92
-22.0	-30.0	111.30	69.8	21.0	11.63	168.8	76.0	1.87
-20.2	-29.0	105.70	71.6	22.0	11.20	170.6	77.0	1.81
-18.4	-28.0	100.40	73.4	23.0	10.78	172.4	78.0	1.76
-16.6	-27.0	95.47	75.2	24.0	10.38	174.2	79.0	1.71
-14.8	-26.0	90.80	77.0	25.0	10.00	176.0	80.0	1.66
-13.0	-25.0	86.39	78.0	26.0	9.63	177.8	81.0	1.62
-11.2	-24.0	82.22	80.6	27.0	9.28	179.6	82.0	1.57
-9.4	-23.0	78.29	82.4	28.0	8.94	181.4	83.0	1.53
-7.6	-22.0	74.58	84.2	29.0	8.62	183.2	84.0	1.49
-5.8	-21.0	71.07	86.0	30.0	8.31	185.0	85.0	1.45
-4.0	-20.0	67.74	87.8	31.0	8.01	186.8	86.0	1.41
-2.2	-19.0	64.54	89.6	32.0	7.72	188.6	87.0	1.37
-0.4	-18.0	61.52	91.4	33.0	7.45	190.4	88.0	1.33
1.4	-17.0	58.66	93.2	34.0	7.19	192.2	89.0	1.30
3.2	-16.0	55.93	95.0	35.0	6.94	194.0	90.0	1.26
5.0	-15.0	53.39	96.8	36.0	6.69	195.8	91.0	1.23
6.8	-14.0	50.96	98.6	37.0	6.46	197.6	92.0	1.20
8.6	-13.0	48.65	100.4	38.0	6.24	199.4	93.0	1.16
10.4	-12.0	46.48	102.2	39.0	6.03	201.2	94.0	1.13
12.2	-11.0	44.41	104.0	40.0	5.82	203.0	95.0	1.10
14.0	-10.0	42.25	105.8	41.0	5.63	204.8	96.0	1.08
15.8	-9.0	40.56	107.6	42.0	5.43	206.6	97.0	1.05
17.6	-8.0	38.76	109.4	43.0	5.25	208.4	98.0	1.02
19.4	-7.0	37.05	111.2	44.0	5.08	210.2	99.0	0.99
21.2	-6.0	35.43	113.0	45.0	4.91	212.0	100.0	0.97
23.0	-5.0	33.89	114.8	46.0	4.74	213.8	101.0	0.94
24.8	-4.0	32.43	116.6	47.0	4.59	215.6	102.0	0.92
26.6	-3.0	31.04	118.4	48.0	4.44	217.4	103.0	0.90
28.4	-2.0	29.72	120.2	49.0	4.30	219.2	104.0	0.87
30.2	-1.0	28.47	122.0	50.0	4.16	221.0	105.0	0.85
32.0	0.0	27.23	123.8	51.0	4.02	222.8	106.0	0.83
			125.6	52.0	3.90	224.6	107.0	0.81
			127.4	53.0	3.77	226.4	108.0	0.79
			129.2	54.0	3.65	228.2	109.0	0.77
			131.0	55.0	3.53	230.0	110.0	0.75



VALVE	A	B	C
BELIMO	RED	BLK	WHT
JOHNSON	RED	BLK	GRY

PANEL LEGEND

ACC = AUXILIARY COMPRESSOR CONTACT
AS = AIR FLOW SWITCH
BC = BLOWER CONTACTOR
BR = BLOWER RELAY
CB = CIRCUIT BREAKER
CC = COMPRESSOR CONTACTOR
CCH = CRANKCASE HEATER
CF = COMPRESSOR FILTER
DAP III = DATA ALARM PROCESSOR III
DP = DISTRIBUTION PRESSURE SWITCH
DS = DISCONNECT SWITCH
ER = ENERGY SAVER RELAY
EXP = EXPANSION MODULE
FU = HUMIDIFIER CONTACTOR
HC = HUMIDIFIER CONTACTOR
HF = HUMIDIFIER FUSE
HFS = HUMIDIFIER SHUTDOWN
HP = HIGH PRESSURE CUTOUT
HTC = REHEATER CONTACTOR
HTF = HEATER FUSE
HUM = HUMIDIFIER
ITR = 24V TO 24V ISOLATION TRANSFORMER
LLS = LIQUID LINE SOLENOID
LP = LOW PRESSURE CUTOUT
MOS = MOTOR OVERLOAD SWITCH
OLR = MOTOR OVERLOAD RELAY
SFS = SECONDARY FLOAT SWITCH FOR THE CONDENSATE PAN
SS = SURGE SUPPRESSOR
TB = TERMINAL BLOCK
TD = TERMINAL BLOCK TIME DELAY CLOSED
TR = TRANSFORMER
WS = WATER SENSING CHANGEOVER THERMOSTAT

= AUXILIARY COMPRESSOR CONTACT
= AIR FLOW SWITCH
= BLOWER CONTACTOR
= BLOWER RELAY
= CIRCUIT BREAKER
= COMPRESSOR CONTACTOR
= CRANKCASE HEATER
= COMPRESSOR FILTER
= DATA ALARM PROCESSOR III
= DISTRIBUTION PRESSURE SWITCH
= DISCONNECT SWITCH
= ENERGY SAVER RELAY
= EXPANSION MODULE
= HUMIDIFIER CONTACTOR
= HUMIDIFIER FUSE
= HUMIDIFIER SHUTDOWN
= HIGH PRESSURE CUTOUT
= REHEATER CONTACTOR
= HEATER FUSE
= HUMIDIFIER
= 24V TO 24V ISOLATION TRANSFORMER
= LIQUID LINE SOLENOID
= LOW PRESSURE CUTOUT
= MOTOR OVERLOAD SWITCH
= MOTOR OVERLOAD RELAY
= SECONDARY FLOAT SWITCH FOR THE CONDENSATE PAN
= SURGE SUPPRESSOR
= TERMINAL BLOCK
= TERMINAL BLOCK TIME DELAY CLOSED
= TRANSFORMER
= WATER SENSING CHANGEOVER THERMOSTAT

= OPTIONAL COMPONENTS
** = APPLIES TO UNITS WITH LARGE COPELAND SCROLL COMPRESSORS (ZR90-ZR19M)
2 = USE ON 560mm/5KW OR GEN II PLUG FAN.
3 = USE ON 5G-91KW UNITS
4 = USE ON 106KW UNITS

= OPTIONAL WIRING
= NORTEC TERMINAL STRIP CONNECTION
= TERMINAL BLOCK NO.

DWG TITLE: gForce DX SERIES with DAP 4 CONTROLLER
JOB NO:
PROJECT NO: GFXS903
DRAWN BY: GABE
CHECKED BY:
EFFECTIVITY DATE: 06-24-2011
OPTION:
REVISION: A
DIAGRAM NO: GFX-S-903

DATA AIRE INC.
230 WEST BLUERIDGE AVENUE
ORANGE, CALIFORNIA 92865

Power Inputs	I/O Board Pin ID	ID Connector Number	Unit TB
Isolated 24 VAC	G	J1-1	TB3-1
Isolated 24 VAC Common	G0	J1-2	TB3-2
Isolated 24 VAC	VG	J4-1	TB3-1
Isolated 24 VAC Common	VG0	J4-2	TB3-2
Control 24 VAC	C1, C4, C9, C16	J12-1, J13-1, J16-1 J22-1	TB1-2B
Control 24 VAC Common	IDC1, IDC9, IDC13, IDC15, IDC17	J5-9, J7-5, J8-3, J19-3, J20-9	TB1-3A

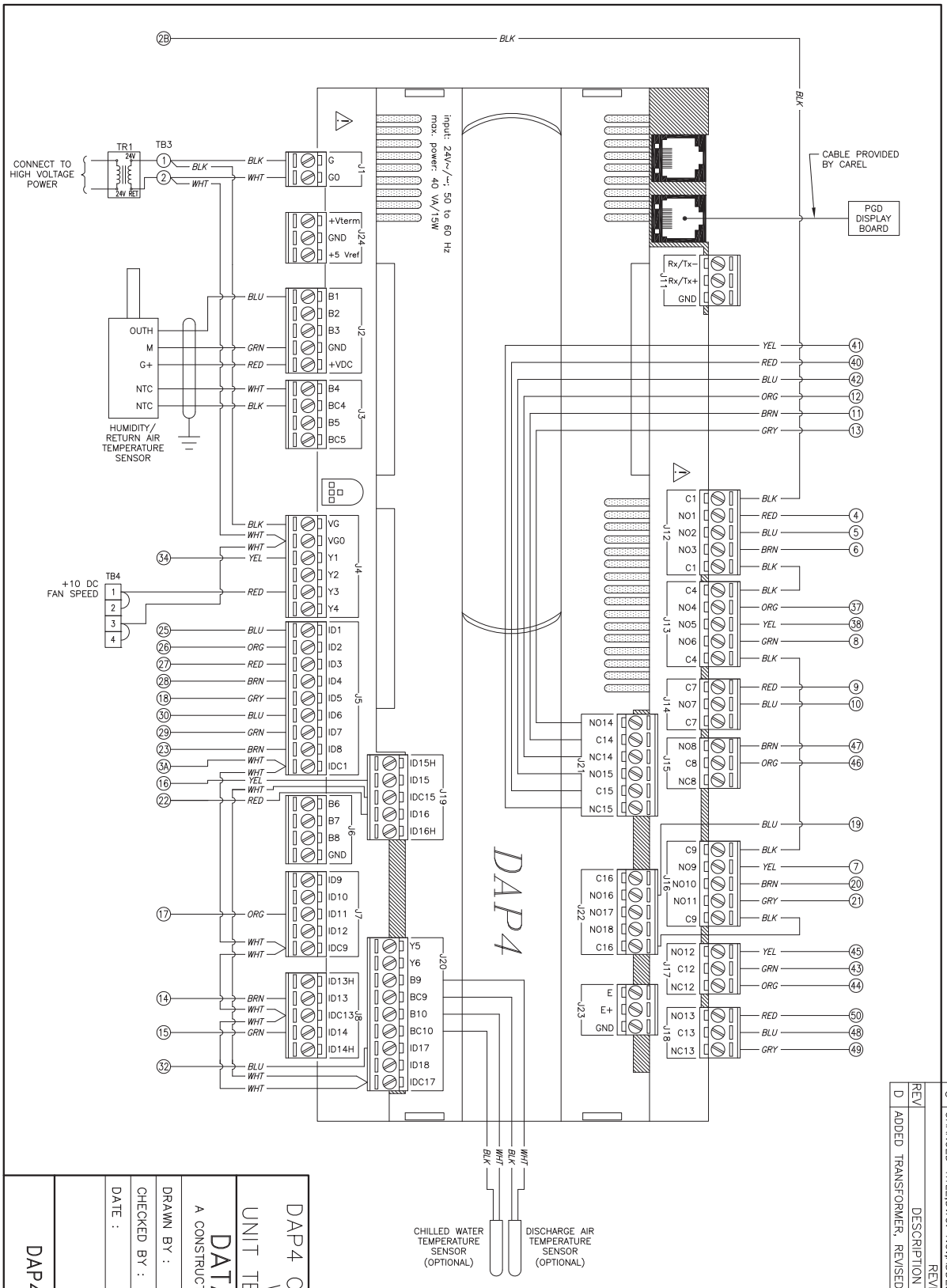
Sensors	Device	I/O Board Pin ID	ID Connector Number	Unit TB
Relative Humidity	H out	B1	J2-1	N/A
	G	+VDC	J2-4	N/A
	G0	GND	J2-5	N/A
Return Air Temperature	NTC	B4	J3-1	N/A
	NTC	BC4	J3-2	N/A
Opt Static Pressure	I/V out	B7	J6-2	N/A
	Ground	GND	J6-4	N/A
Opt Air Discharge	NTC	B9	J20-3	N/A
	NTC	BC9	J20-4	N/A
Opt Chilled Water Temperature	NTC	B10	J20-5	N/A
	NTC	BC10	J20-6	N/A

Alarms – Digital Inputs	I/O Board Pin ID	ID Connector Number	Unit TB
Compressor 1 High Pressure Alarm	ID1	J5-1	TB1-25
Compressor 1 Low Pressure Alarm	1D2	J5-2	TB2-26
Compressor 2 High Pressure Alarm	1D3	J5-3	TB2-27
Compressor 2 Low Pressure Alarm	ID4	J5-4	TB2-28
No Airflow Alarm	ID5	J5-5	TB2-18
Opt No Water Flow Alarm	ID6	J5-6	TB2-30
Opt Smoke Detector Alarm	ID7	J5-7	TB2-29
Dirty Filter Alarm	ID8	J5-8	TB1-23
Opt Humidifier Failure Alarm	ID9	J7-1	TB1-24
Opt Energy Saver Signal	1D10	J7-2	TB2-31
Opt High Condensate Water Level Alarm	ID11	J7-3	TB1-17
Opt Alarm Input 1	ID13	J8-2	TB1-14
Opt Alarm Input 2	ID14	J8-4	TB1-15
Opt Alarm Input 3	ID15	J19-2	TB1-16
Opt Alarm Input 4	ID16	J19-4	TB1-22
Water Under Floor Alarm	ID17	J20-7	TB2-32
Manual Override Active	ID18	J20-8	MOS-12

dap4 I/O Control Board and Unit Terminal Block Pin ID Number

Control & Alarms – Digital Outputs	I/O Board Pin ID	ID Connector Number	Unit TB
System Blower	NO1	J12-2	TB1-4
Compressor 1	NO2	J12-3	TB1-5
Compressor 2	NO3	J12-4	TB1-6
Opt Cooling 3rd Stage	NO4	J13-2	TB2-37
Opt Cooling 4th Stage	NO5	J13-3	TB2-38
Humidifier	NO6	J13-4	TB1-8
Status Contact	C7	J14-1	TB1-9
	NO7	J14-2	TB1-10
Condenser Aux	NO8	J15-1	TB2-47
	C8	J15-2	TB2-46
Reheat 1	NO9	J16-2	TB1-7
Reheat 2	NO10	J16-3	TB1-20
Reheat 3	NO11	J16-4	TB1-21
Alarm 3	NO12	J17-1	TB1-45
	C12	J17-2	TB1-43
	NC-12	J17-3	TB1-44
Alarm 4	NO13	J18-1	TB2-50
	C13	J18-2	TB2-48
	NO13	J18-3	TB2-49
Alarm 1	NO14	J21-1	TB1-13
	C14	J21-2	TB1-11
	NC14	J21-3	TB1-12
Alarm 2	NO15	J21-4	TB1-42
	C15	J21-5	TB1-40
	NC15	J21-6	TB1-41
Opt Energy Saver	NO16	J22-2	TB1-19
Opt Humidifier Drain (Autoflush)	NO17	J22-3	TB2-39

Control – Analog Output	I/O Board Pin ID	ID Connector Number	Unit TB
Water Valve Control	Y1	J4-3	TB2-34
	VG0	J4-2	TB2-35
Opt Humidifier Modulating Control	Y2	J4-4	TB2-51
	VG0	J4-2	TB2-52
Blower Fan Speed Control	Y3	J4-5	TB4-1, 2
	VG0	J4-2	TB4-3,4



REVISIONS			
REV	DESCRIPTION	DATE	BY
C	CHANGED TITLE,DWG. NO.,ADDED WIRE COLORS	05-20-2011	JDP
D	ADDED TRANSFORMER, REVISED TB3 & TB4	06-08-2011	JDP

DAP4 CONTROL MODULE WIRING TO UNIT TERMINAL BLOCKS

DATA AIRE INC.
A CONSTRUCTION SPECIALTIES INC. Company

DRAWN BY : J. PATTON | SCALE: NONE
CHECKED BY : | SH 1 OF 1
DATE : 06-08-2011 | REV D

PART OF
DAP4 TO UNIT TBS
DWG NO.

Manual Override Switches

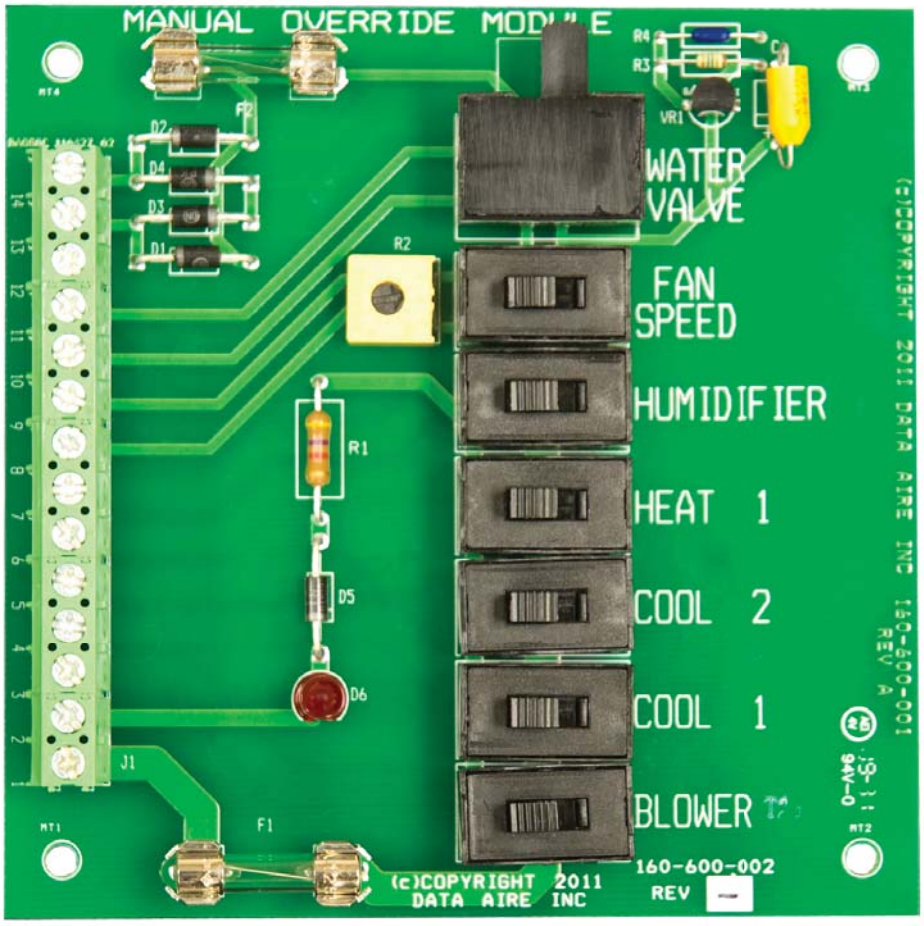
For testing and during start-up each Data Aire gForce unit is provided with manual override slide switches. There are seven slide switches. One for each of the following functions:

Water Valve	**Fan Speed**
Humidifier	**Heat 1**
Cool 2	**Cool 1**
Blower	

All automatic control is disabled but the safety switches remain functional. Simply slide the manual switches to energize the blower, compressors, humidification, reheat and other functions.

The fan speed of the EC (Electronically Commutated) motor can be adjusted from 0 – 10 volts by adjusting the potentiometer at the left of the **Fan Speed** switch. The fan will turn 10% for each volt adjustment. One volt equals 10%. At ten volts the motor is at full speed.

Warning: Do not leave the unit in manual override. Slide the switches to the OFF position when completing testing and/or start-up. An alarm will be activated if units are left in the ON position.



Notes

230 W. BlueRidge Avenue
Orange, CA 92865
800-347-2473

www.dataaire.com e-mail: sales@dataaire.com

A Member of the CS Group of Companies

© 2011 Data Aire, Inc.

Data Aire, Inc. reserves the right to make design changes for the purpose of product improvement or to withdraw any design without notice.

dap4-IOM-0811